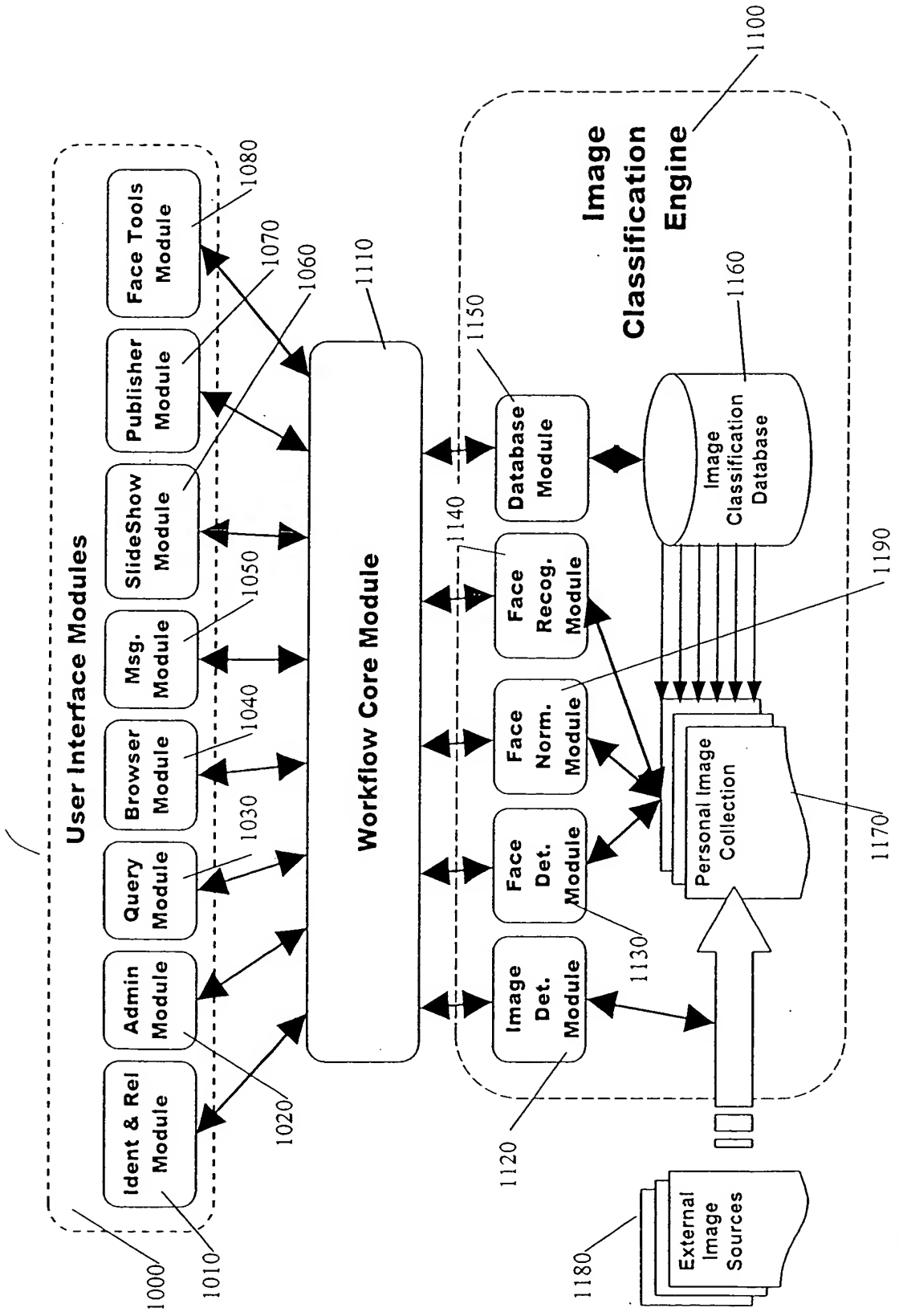

User Interface Modules
Face Tools Module
Publisher Module
SlideShow Module
Msg. Module
Browser Module
Query Module
Admin Module
Ident & Rel Module
Workflow Core Module
Image Classification Engine
Database Module
Face Recog. Module
Face Norm. Module
Face Det. Module
Image Det. Module
Image Classification Database
Personal Image Collection
External Image Sources
1000
1010
1020
1030
1040
1050
1060
1070
1080
1100
1110
1120
1130
1140
1150
1160
1170
1180
1190

Fig 1(a)

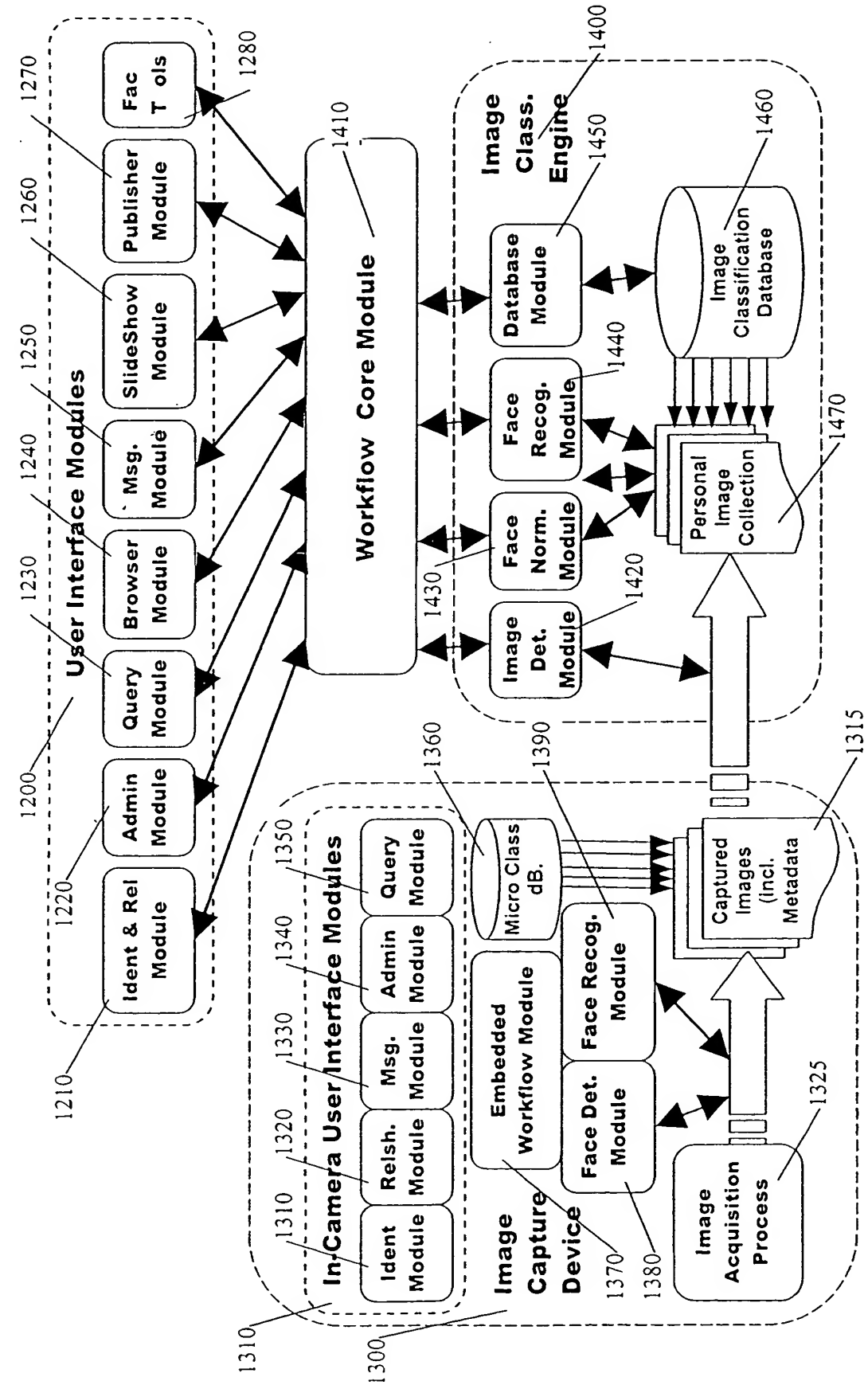

User Interface Modules
Ident & Rel Module
Admin Module
Query Module
Browser Module
Msg. Module
SlideShow Module
Publisher Module
Fac T ols
Workflow Core Module
Image Class. Engine
Database Module
Face Recog. Module
Face Norm. Module
Image Det. Module
Image Classification Database
Personal Image Collection
In-Camera User Interface Modules
Ident Module
Relsh. Module
Msg. Module
Admin Module
Query Module
Embedded Workflow Module
Micro Class dB.
Face Det. Module
Face Recog. Module
Captured Images (incl. Metadata
Image Acquisition Process
Image Capture Device
1200
1210
1220
1230
1240
1250
1260
1270
1280
1300
1310
1315
1320
1325
1330
1340
1350
1360
1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470

Fig 1(b)

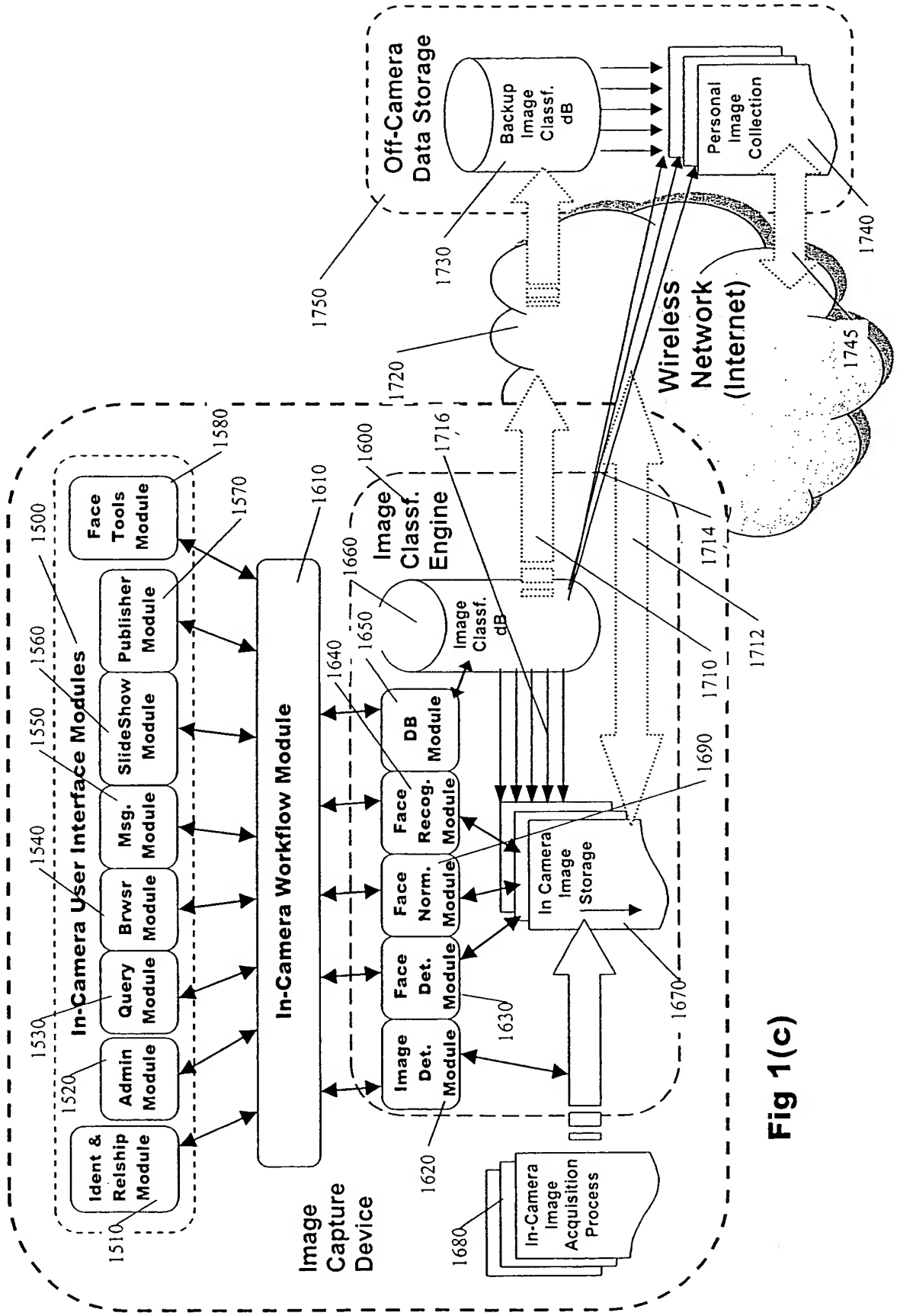

Off-Camera Data Storage
Backup Image Classf. dB
Personal Image Collection
Wireless Network (Internet)
Image Classf. Engine
Image Classf. dB
In-Camera User Interface Modules
Face Tools Module
Publisher Module
SlideShow Module
Msg. Module
Brwsr Module
Query Module
Admin Module
Ident & Relship Module
In-Camera Workflow Module
DB Module
Face Recog. Module
Face Norm. Module
Face Det. Module
Image Det. Module
In Camera Image Storage
In-Camera Image Acquisition Process
Image Capture Device
1750
1730
1740
1720
1745
1716
1600
1580
1570
1610
1500
1660
1650
1640
1560
1550
1540
1530
1520
1510
1714
1712
1710
1690
1670
1630
1620
1680

Fig 1(c)

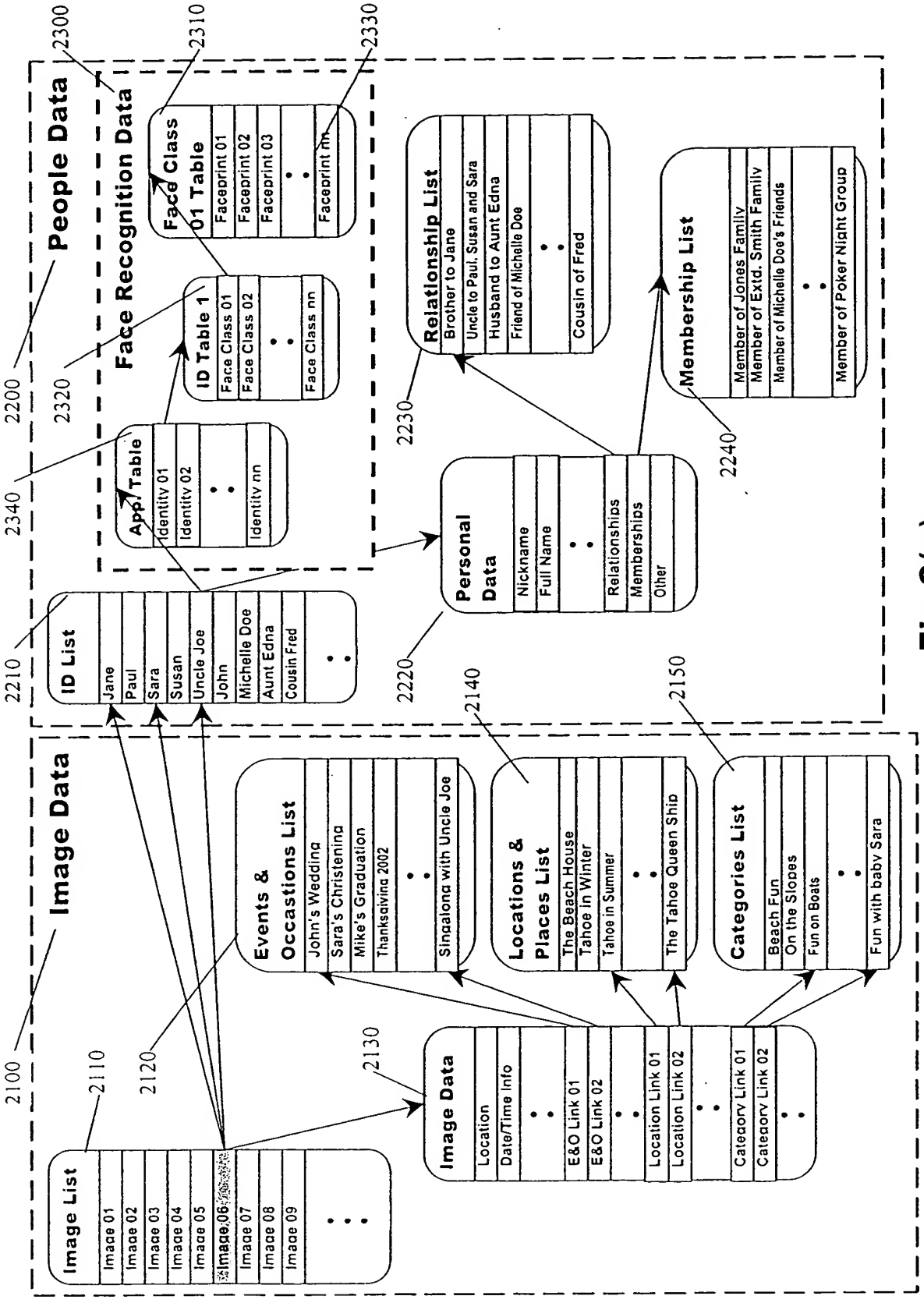


Image Data
2100
Image List
2110
Image 01
Image 02
Image 03
Image 04
Image 05
Image 06
Image 07
Image 08
Image 09
2120
2130
Image Data
Location
Date/Time Info
E&O Link 01
E&O Link 02
Location Link 01
Location Link 02
Category Link 01
Category Link 02
Events & Occastions List
2140
John's Wedding
Sara's Christening
Mike's Graduation
Thanksgiving 2002
Singalong with Uncle Joe
Locations & Places List
The Beach House
Tahoe in Winter
Tahoe in Summer
The Tahoe Queen Ship
2150
Categories List
Beach Fun
On the Slopes
Fun on Boats
Fun with baby Sara
People Data
2200
ID List
2210
Jane
Paul
Sara
Susan
Uncle Joe
John
Michelle Doe
Aunt Edna
Cousin Fred
Face Recognition Data
2300
App. Table
2340
Identity 01
Identity 02
Identity nn
ID Table 1
2320
Face Class 01
Face Class 02
Face Class nn
Face Class 01 Table
2310
Faceprint 01
Faceprint 02
Faceprint 03
Faceprint nn
2330
Personal Data
2220
Nickname
Full Name
Relationships
Memberships
Other
Relationship List
2230
Brother to Jane
Uncle to Paul, Susan and Sara
Husband to Aunt Edna
Friend of Michelle Doe
Cousin of Fred
Membership List
2240
Member of Jones Family
Member of Extd. Smith Family
Member of Michelle Doe's Friends
Member of Poker Night Group

Fig 2(a)

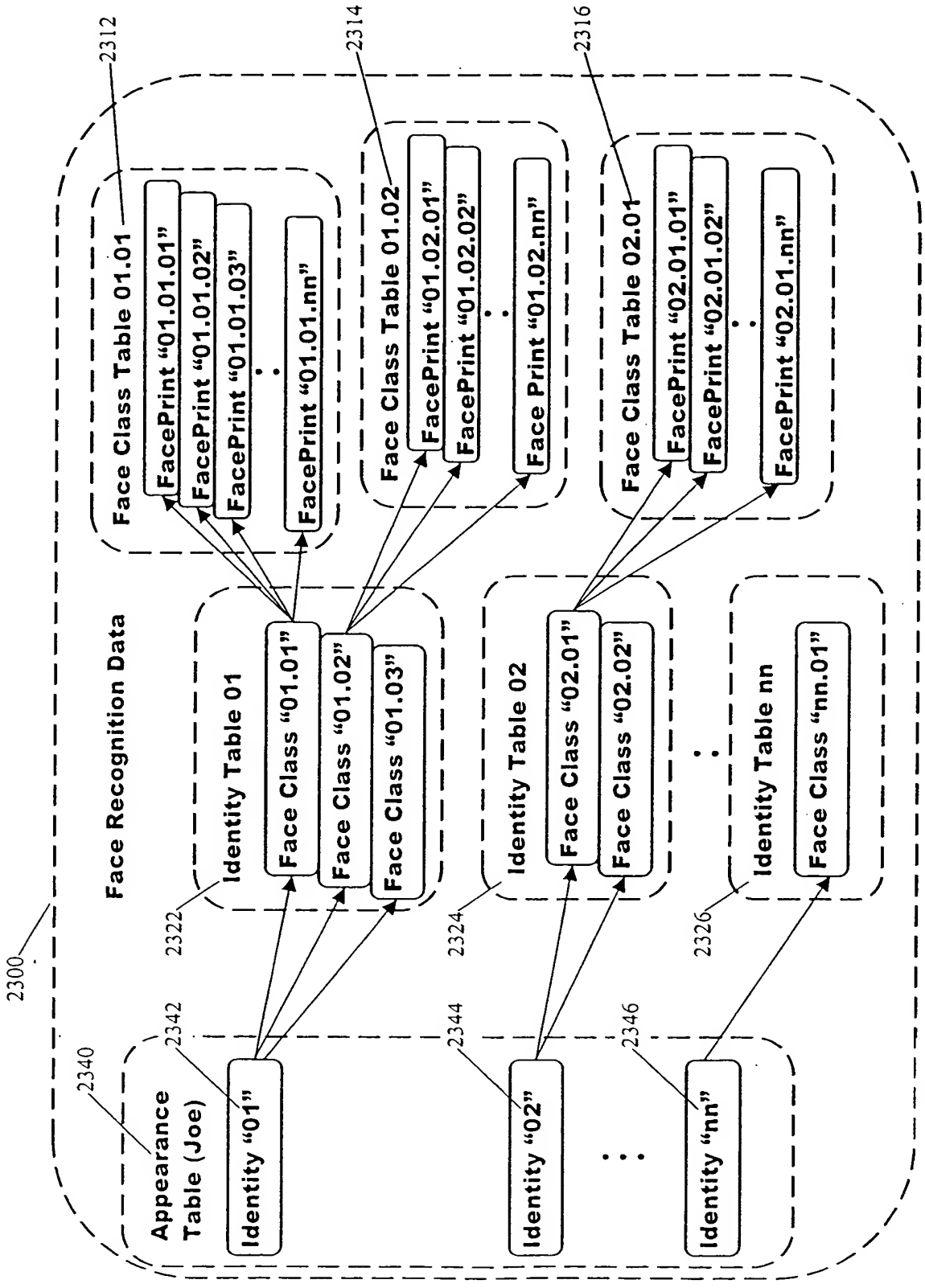

2300
Face Recognition Data
2312
Face Class Table 01.01
FacePrint "01.01.01"
FacePrint "01.01.02"
FacePrint "01.01.03"
FacePrint "01.01.nn"
2314
Face Class Table 01.02
FacePrint "01.02.01"
FacePrint "01.02.02"
Face Print "01.02.nn"
2316
Face Class Table 02.01
FacePrint "02.01.01"
FacePrint "02.01.02"
FacePrint "02.01.nn"
2322
Identity Table 01
Face Class "01.01"
Face Class "01.02"
Face Class "01.03"
2324
Identity Table 02
Face Class "02.01"
Face Class "02.02"
2326
Identity Table nn
Face Class "nn.01"
2340
Appearance Table (Joe)
2342
Identity "01"
2344
Identity "02"
2346
Identity "nn"

Fig 2(b)

Face Detection Workflow (Detection Module)

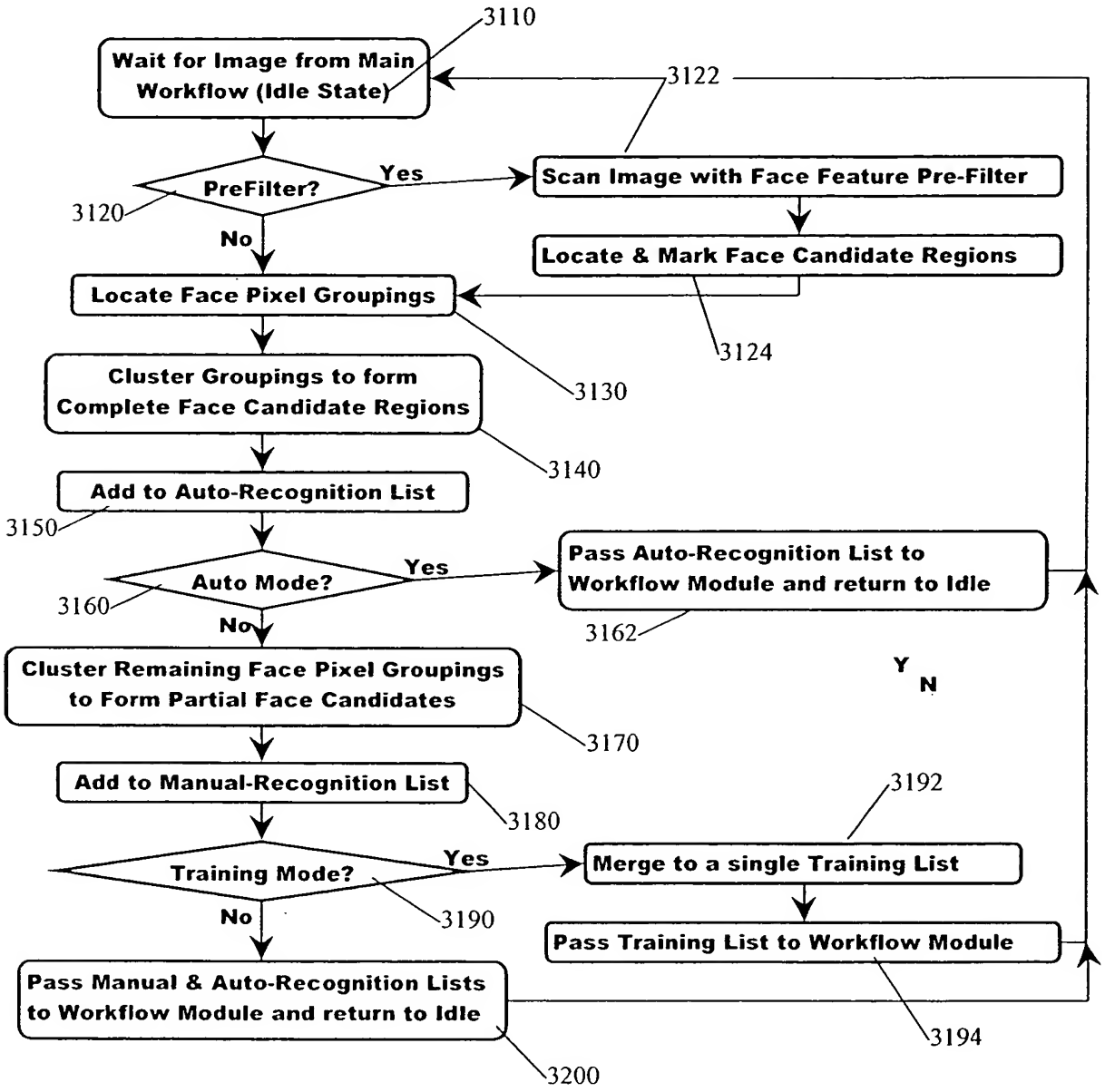


Fig 3

Core System Workflow (Workflow Module I)

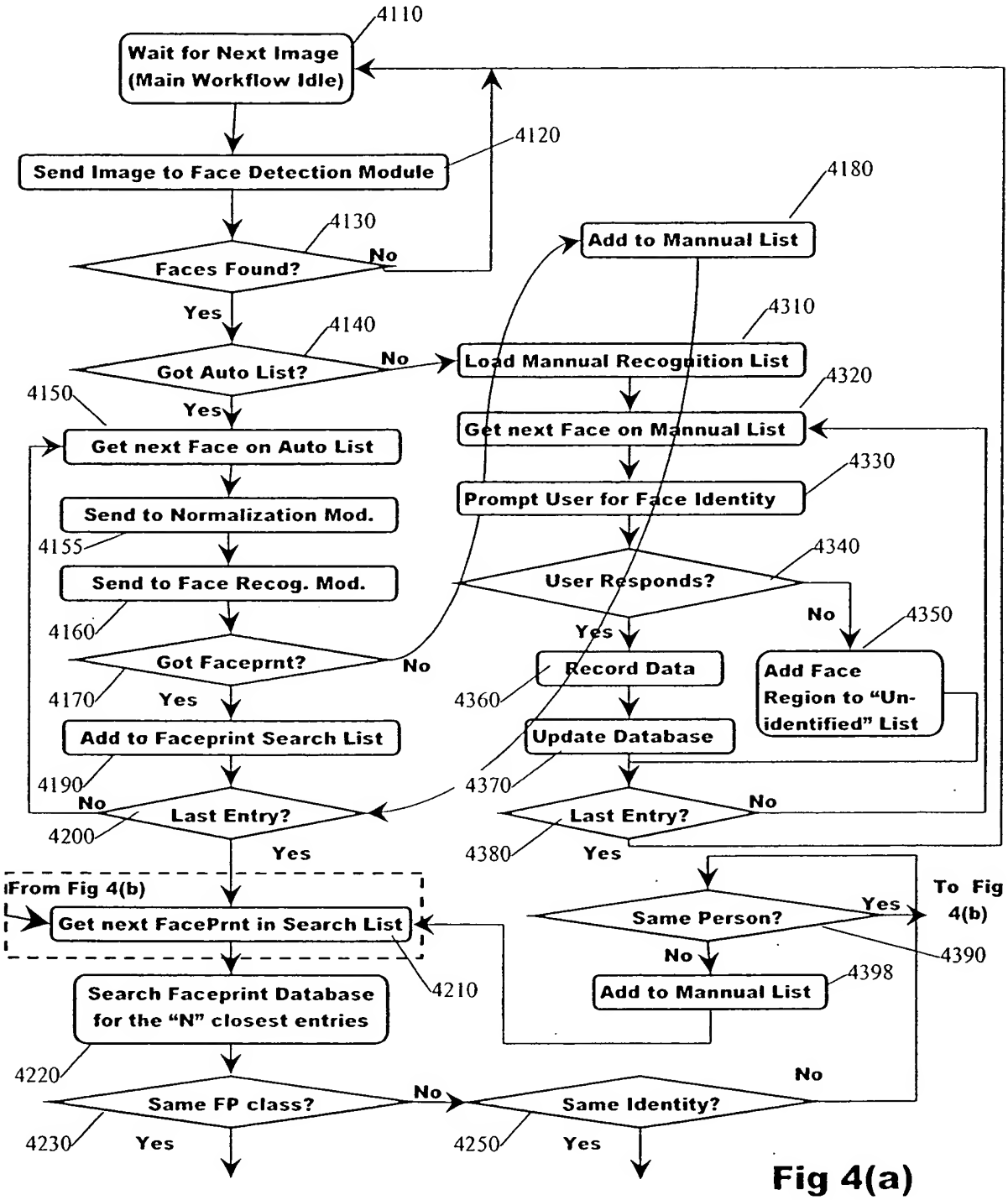


Fig 4(a)

Core System Workflow (Workflow Module II)

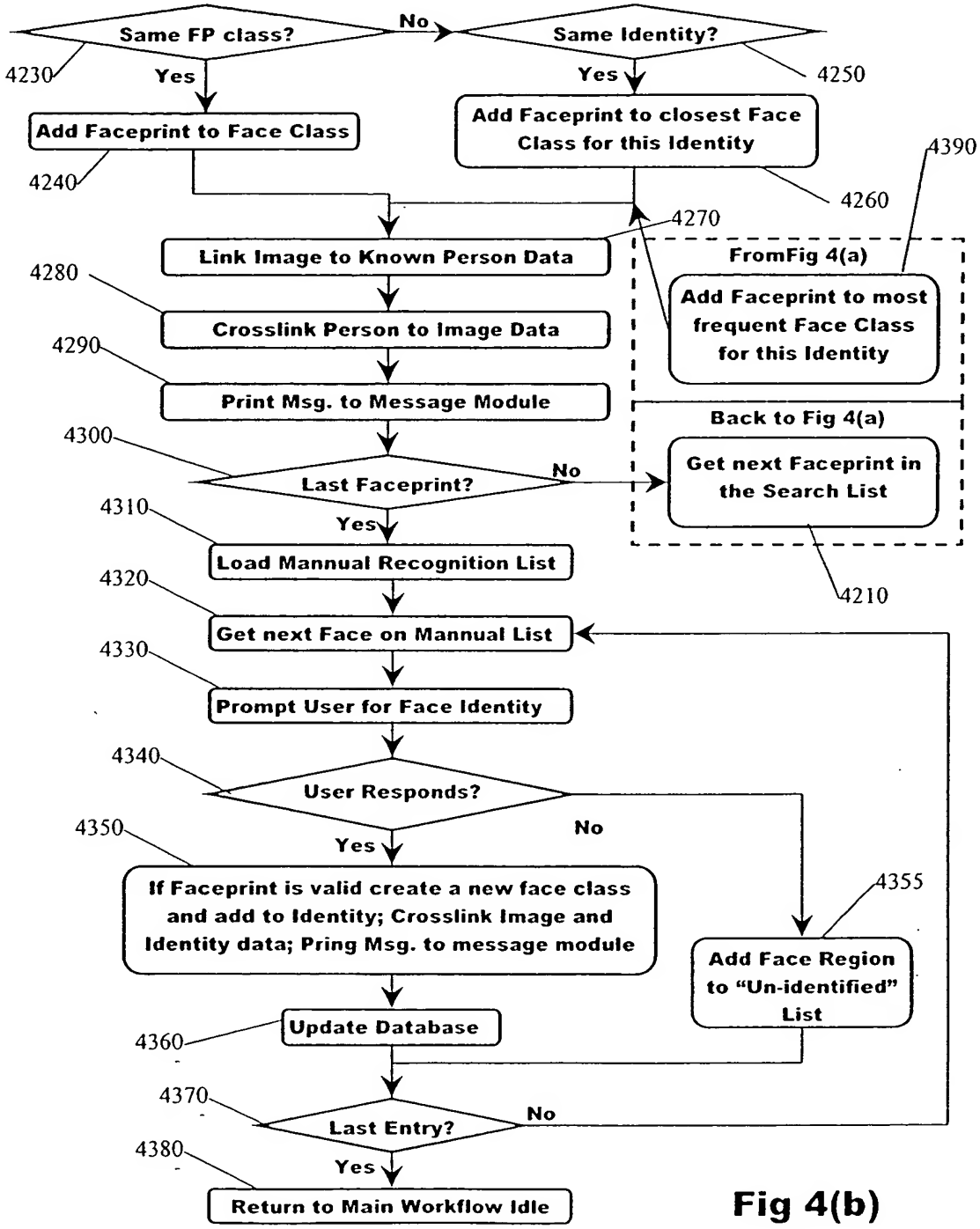


Fig 4(b)

Face Normalization Module (Mode A)

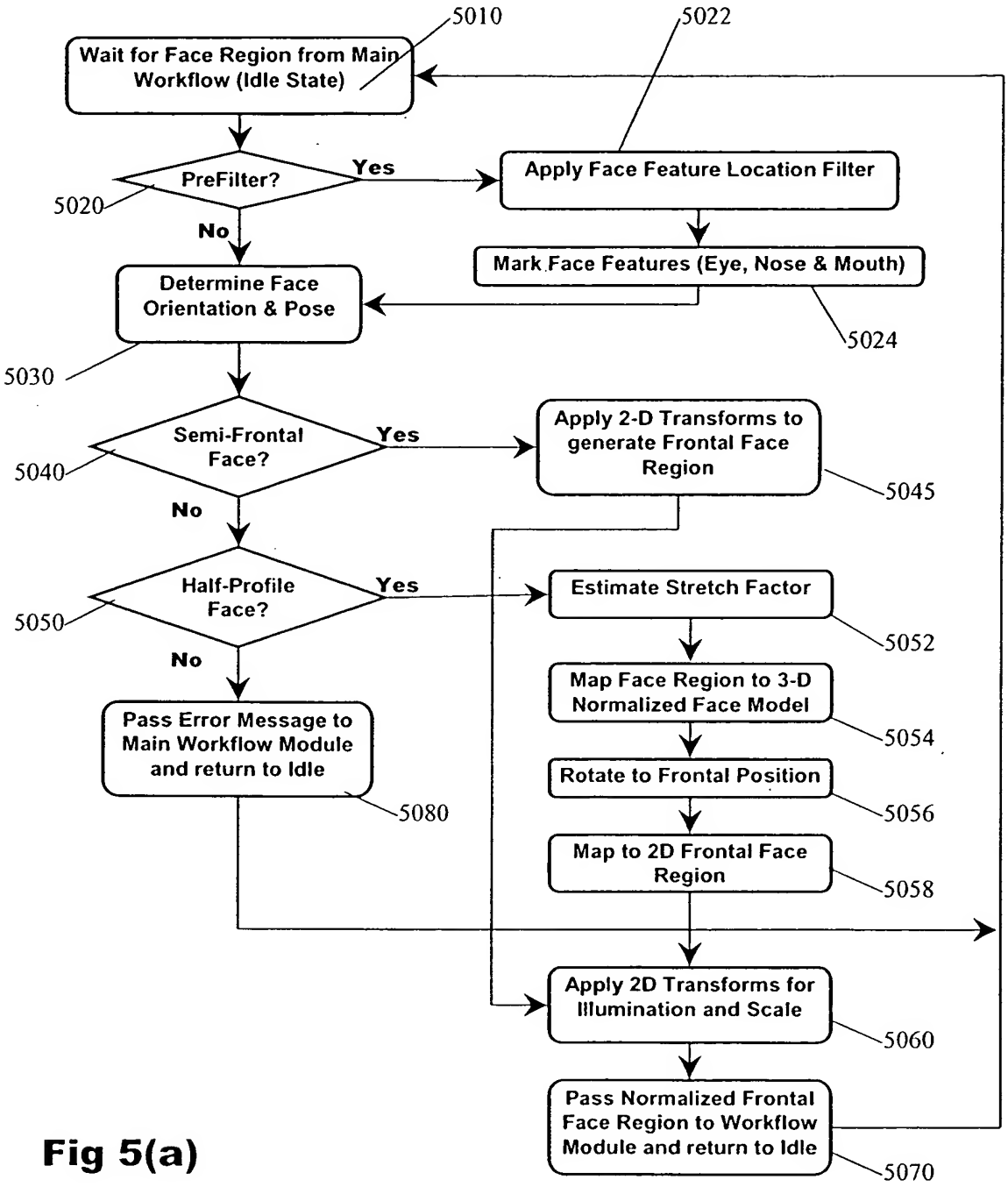


Fig 5(a)

Face Normalization Module (Mode B)

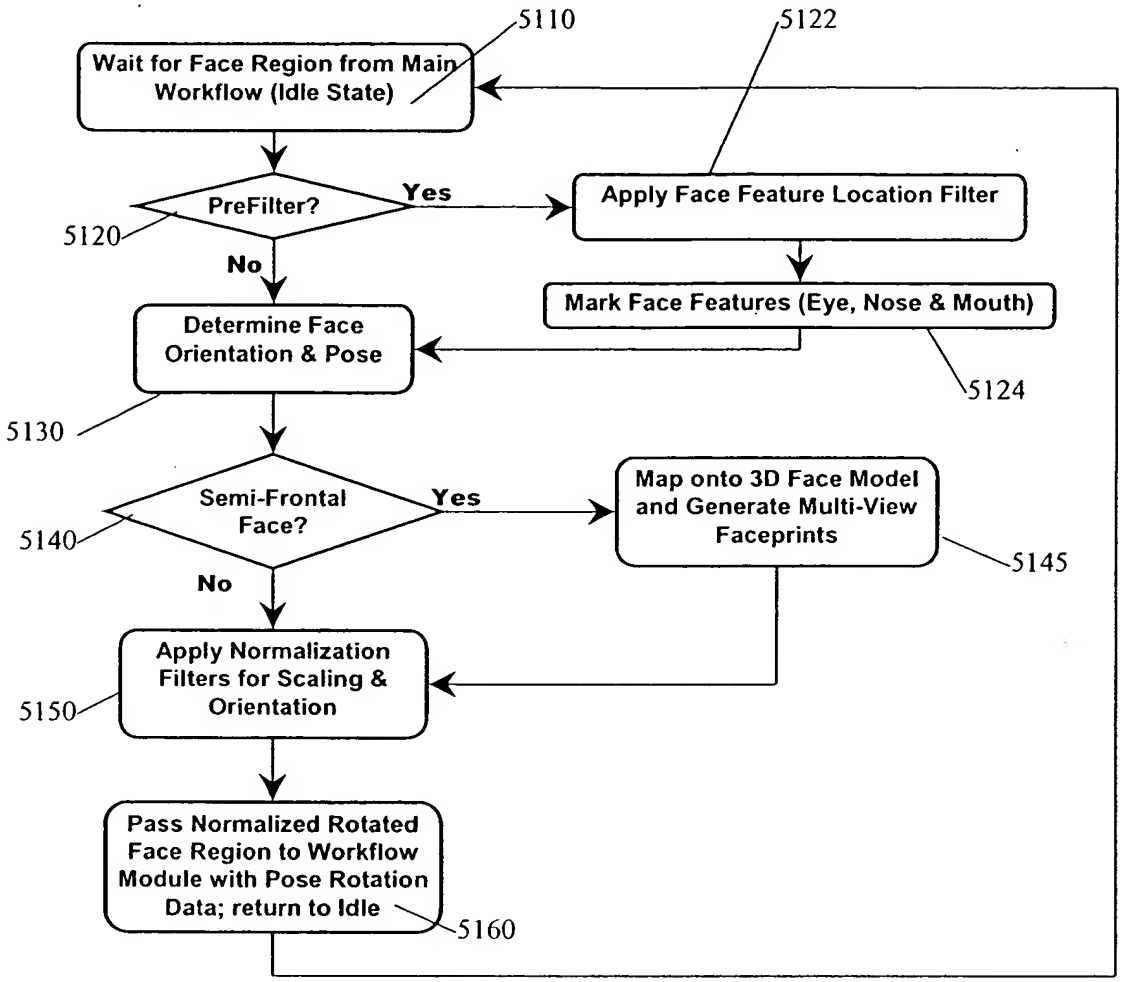


Fig 5(b)

Fig 6(a)

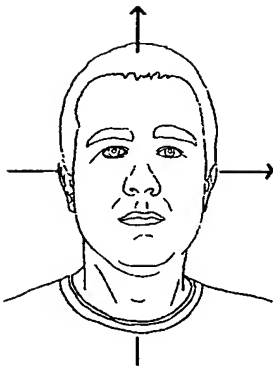


Fig 6(b)

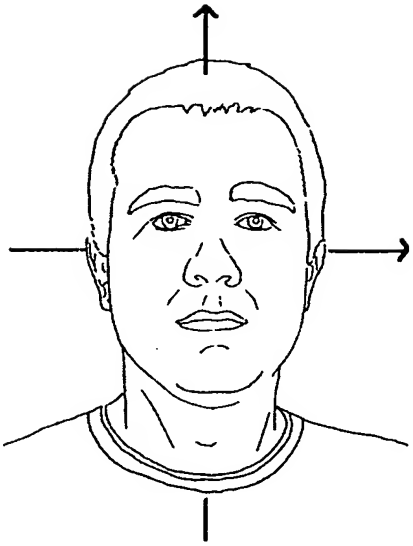


Fig 6(c)

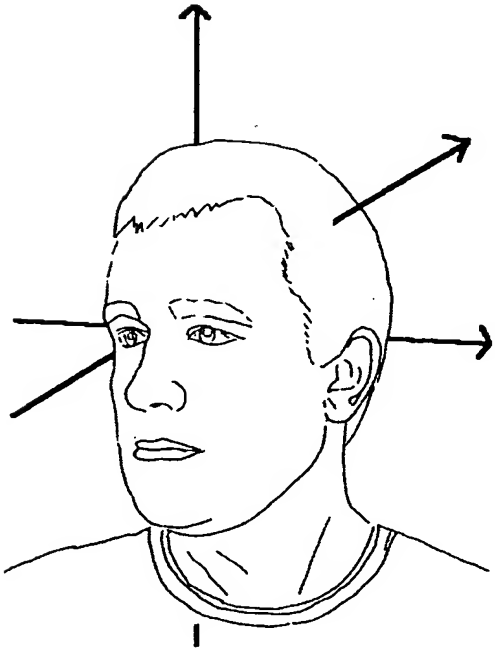


Fig 6(d)

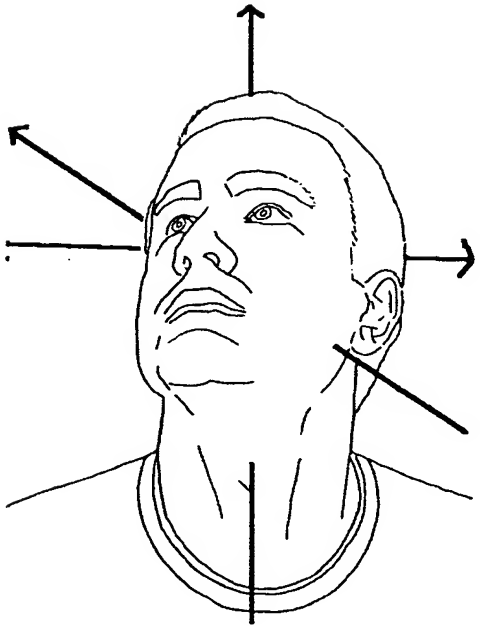


Fig 6(e)

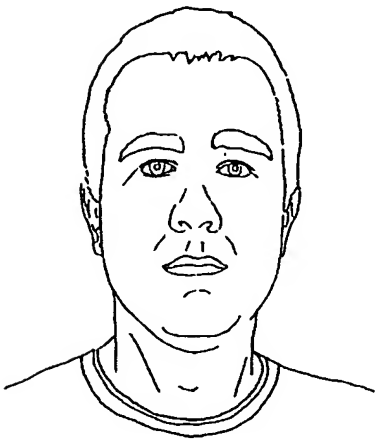


Fig 7(a)

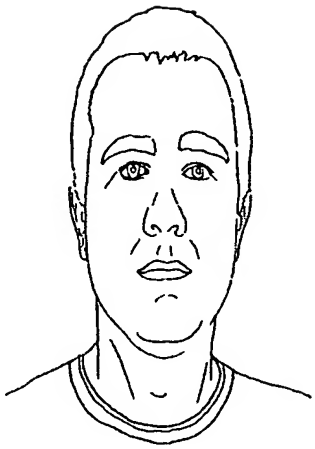


Fig 7(b)

Fig 7(c)

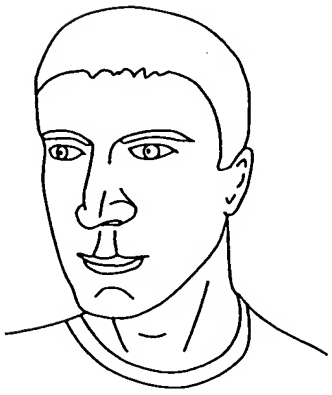


Fig. 7D

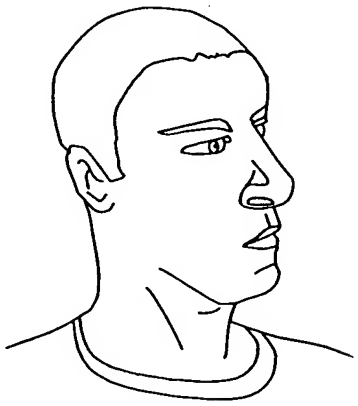


Fig. 7E

Fig. 7F

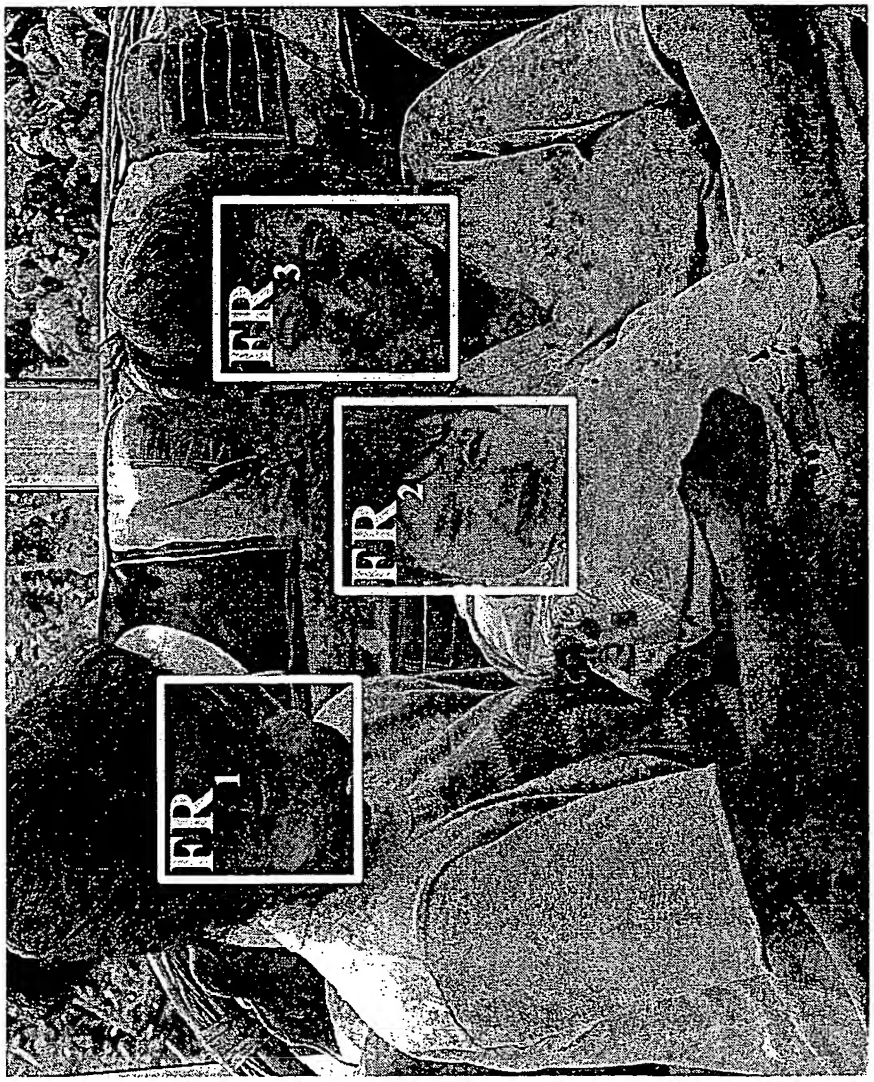


Fig 8(a)

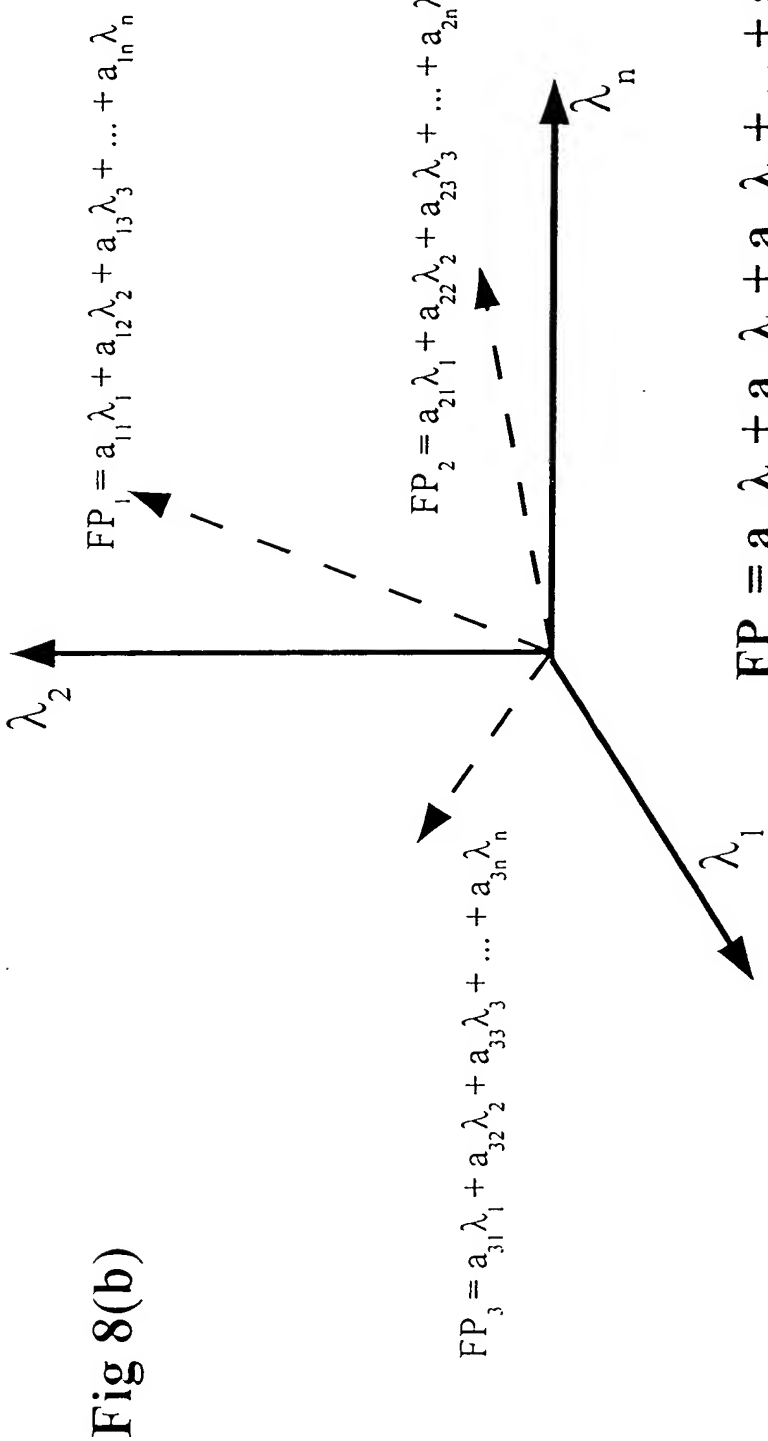


Fig 8(b)

$$FP_1 = a_{11}\lambda_1 + a_{12}\lambda_2 + a_{13}\lambda_3 + \ldots + a_{1n}\lambda_n$$
$$FP_2 = a_{21}\lambda_1 + a_{22}\lambda_2 + a_{23}\lambda_3 + \ldots + a_{2n}\lambda_n$$
$$FP_m = a_{m1}\lambda_1 + a_{m2}\lambda_2 + a_{m3}\lambda_3 + \ldots + a_{mn}\lambda_n$$

Figure 8(c)

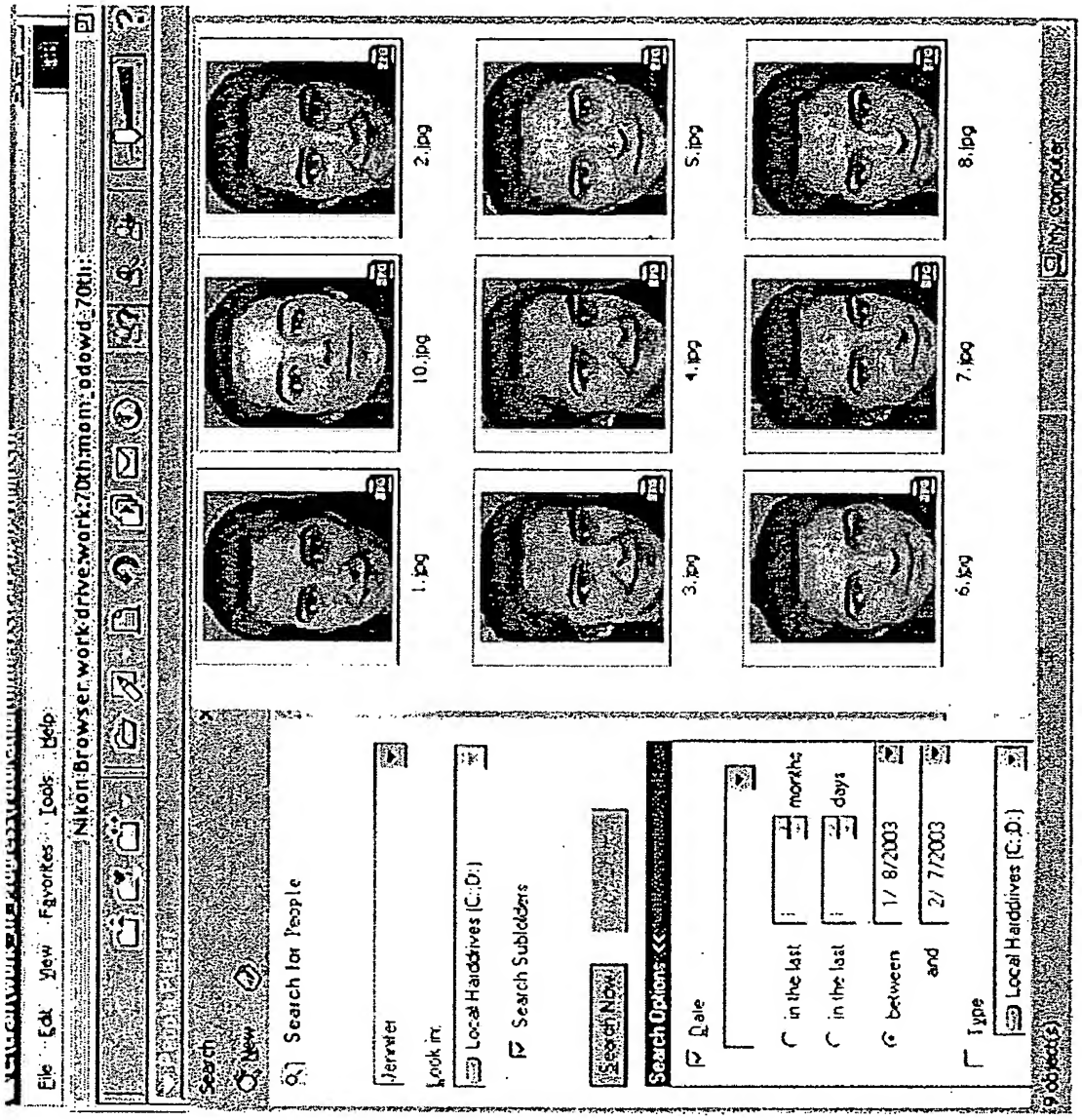
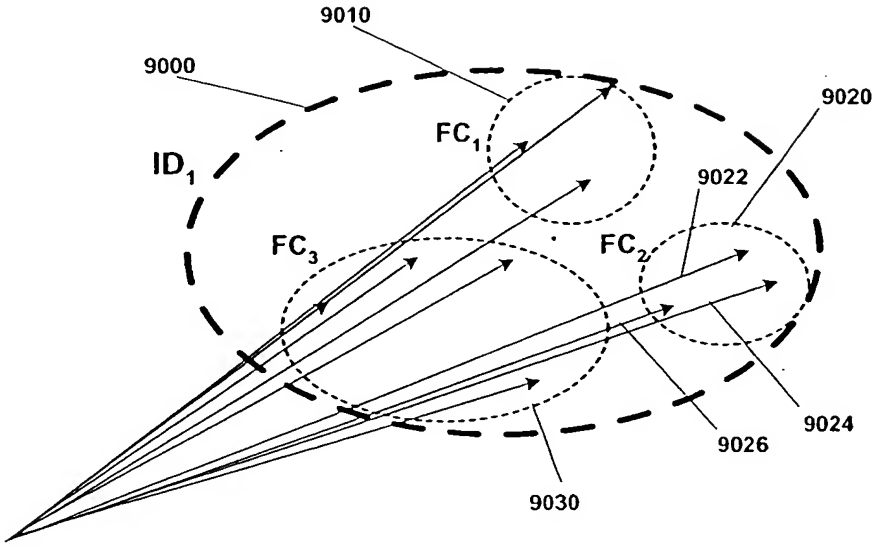

File Edit View Favorites Tools Help
Nikon Browser.work:drive:work:70th:mom_odowd_70th:
Search
Folders
Search for People
Jennifer
Look in:
Local Harddrives (C:,D:)
Search Subfolders
Search Now
Search Options <<
Date
in the last
months
in the last
days
between
1/ 8/2003
and
2/ 7/2003
Type
Local Harddrives (C:,D:)
9 object(s)
My Computer
1.jpg
2.jpg
10.jpg
3.jpg
4.jpg
5.jpg
6.jpg
7.jpg
8.jpg

Fig 9(a)


9010
9000
9020
FC_1
ID_1
9022
FC_3
FC_2
9024
9026
9030

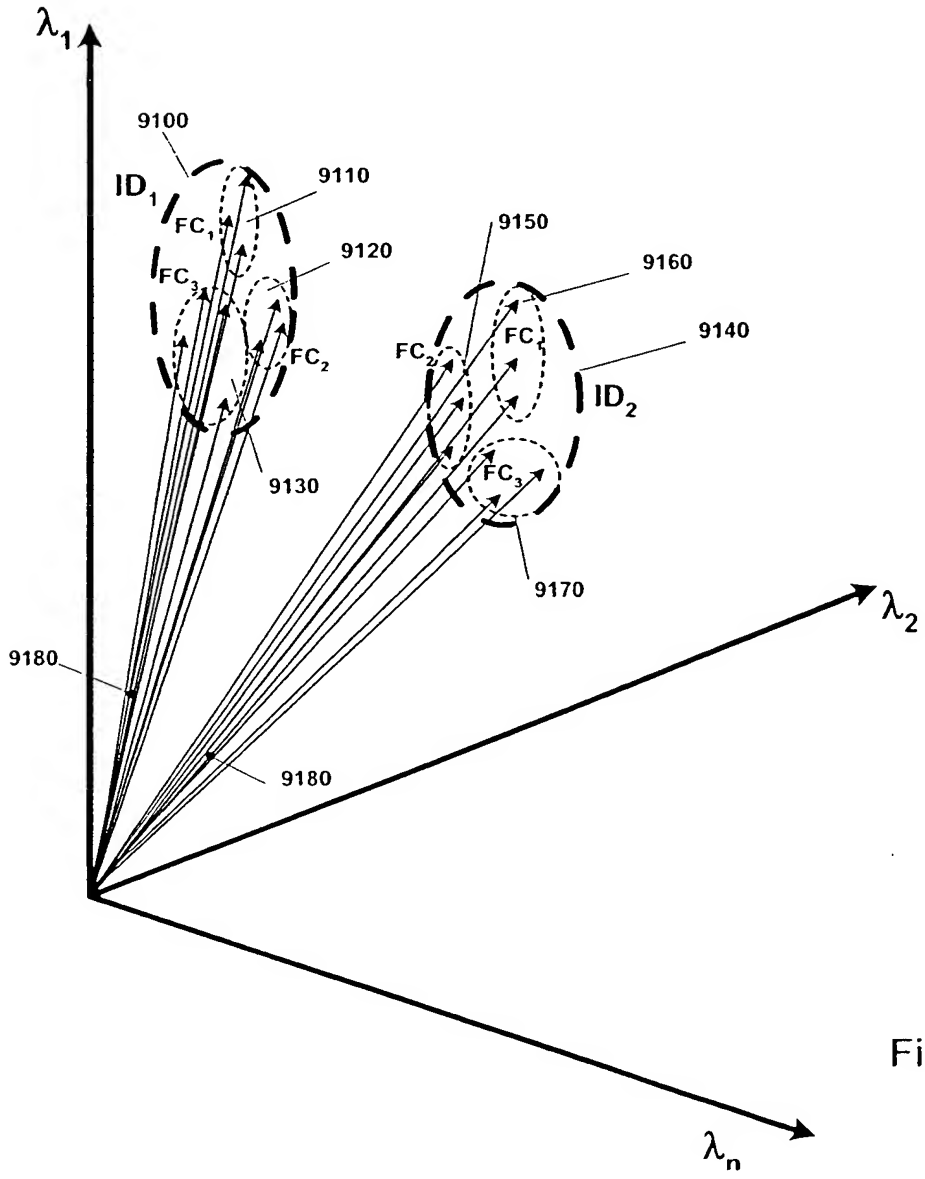

λ_1
9100
ID_1
9110
FC_1
9120
FC_3
FC_2
9130
9150
9160
FC_2
FC_1
9140
ID_2
FC_3
9170
λ_2
9180
9180
λ_n

Fig 9(b)

Fig 10(a)

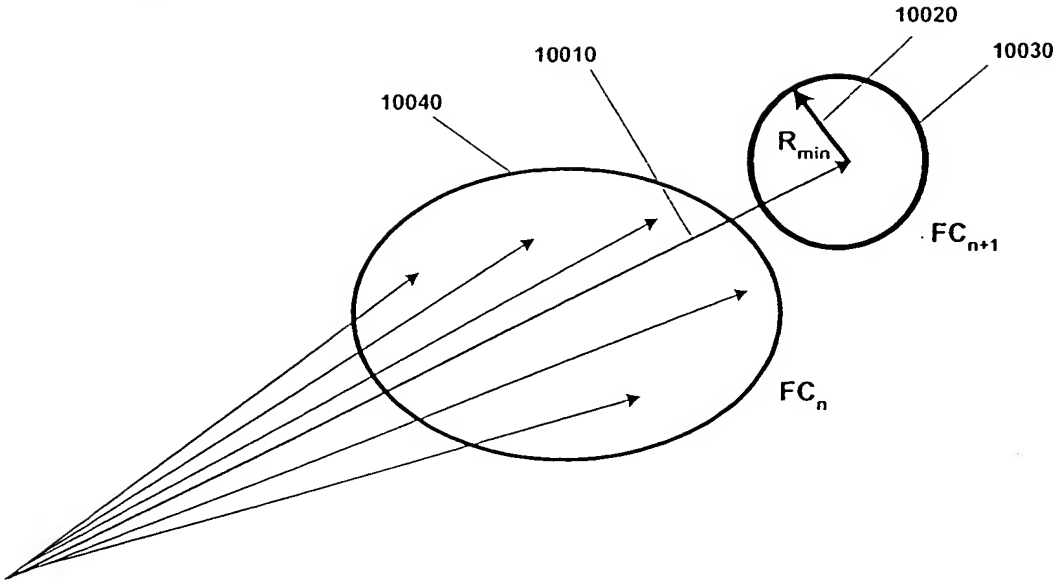
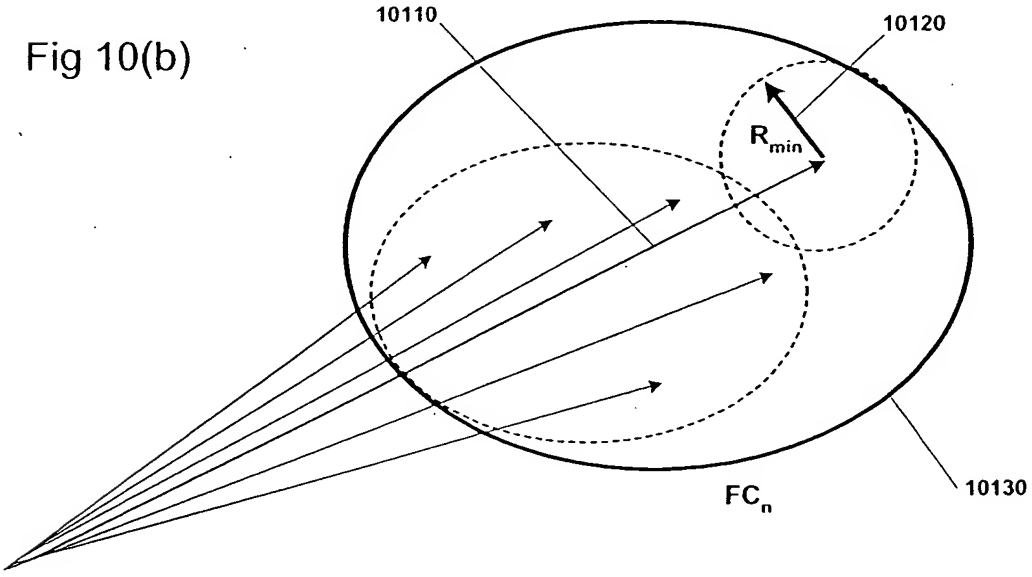


Fig 10(b)



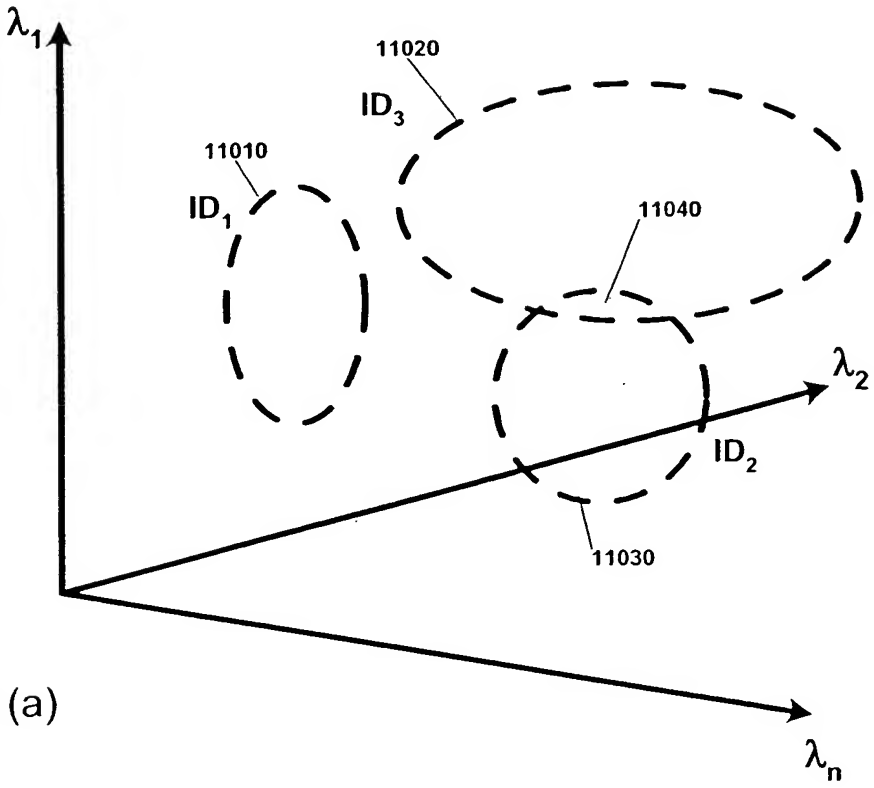


Fig 11(a)

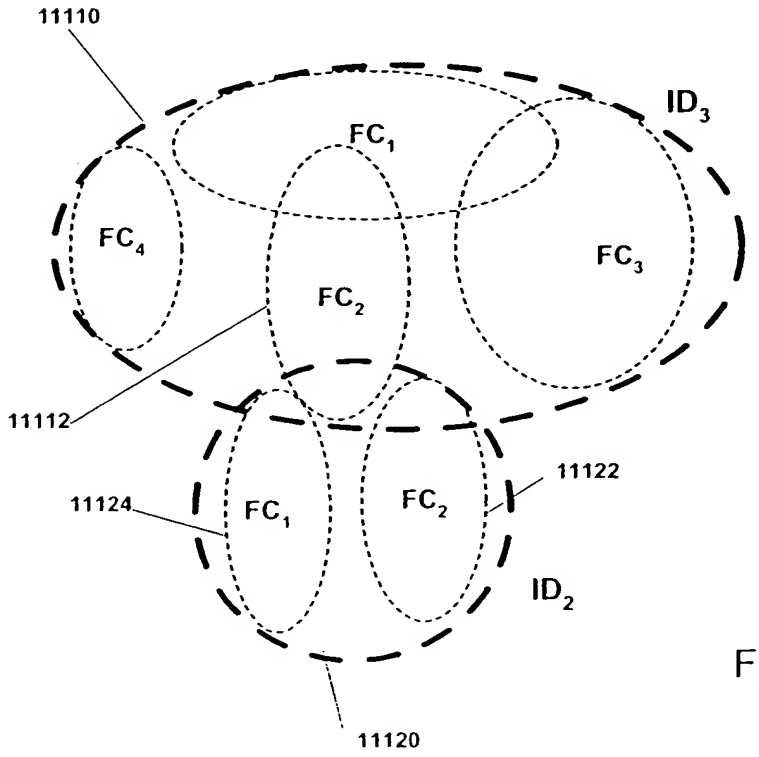


Fig 11(b)

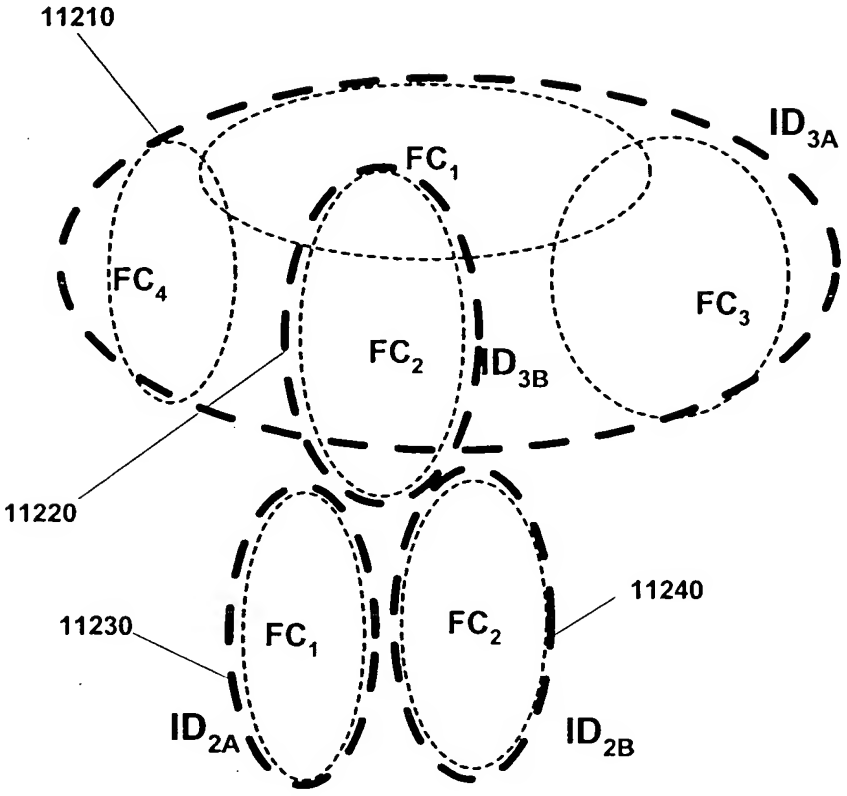

11210
ID3A
FC1
FC4
FC3
FC2
ID3B
11220
11240
11230
FC1
FC2
ID2A
ID2B

Fig 11(c)

Fig 12(a)

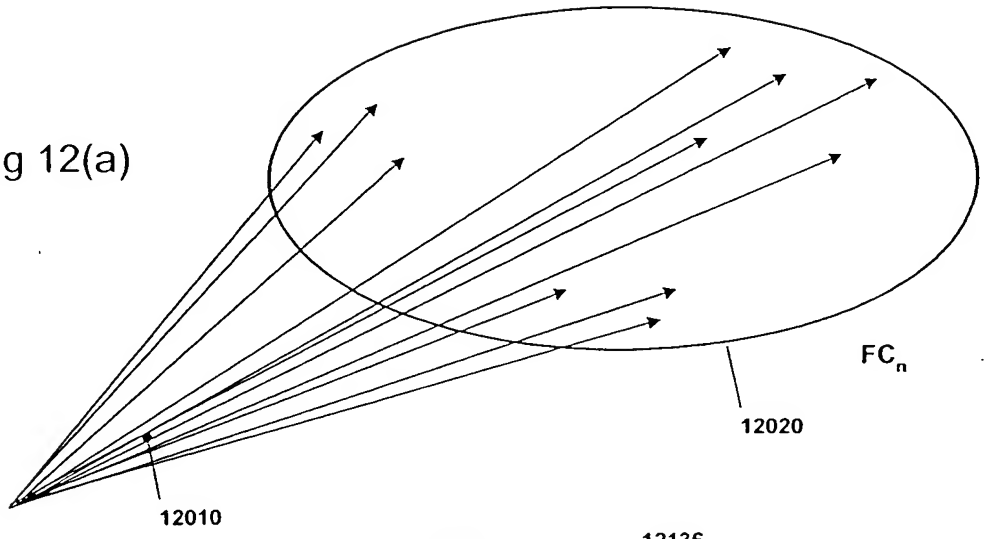


Fig 12(b)

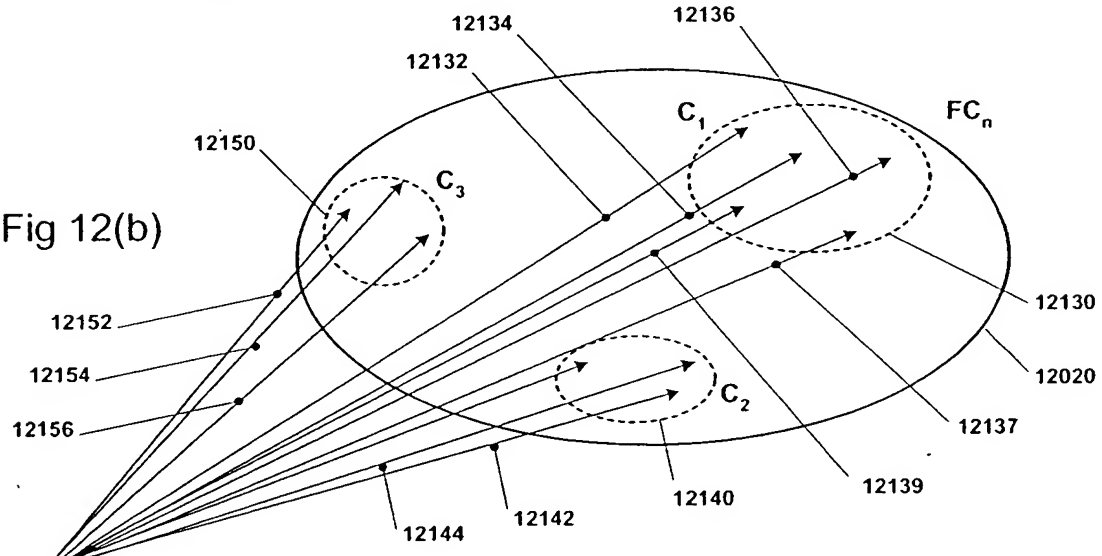


Fig 12(c)

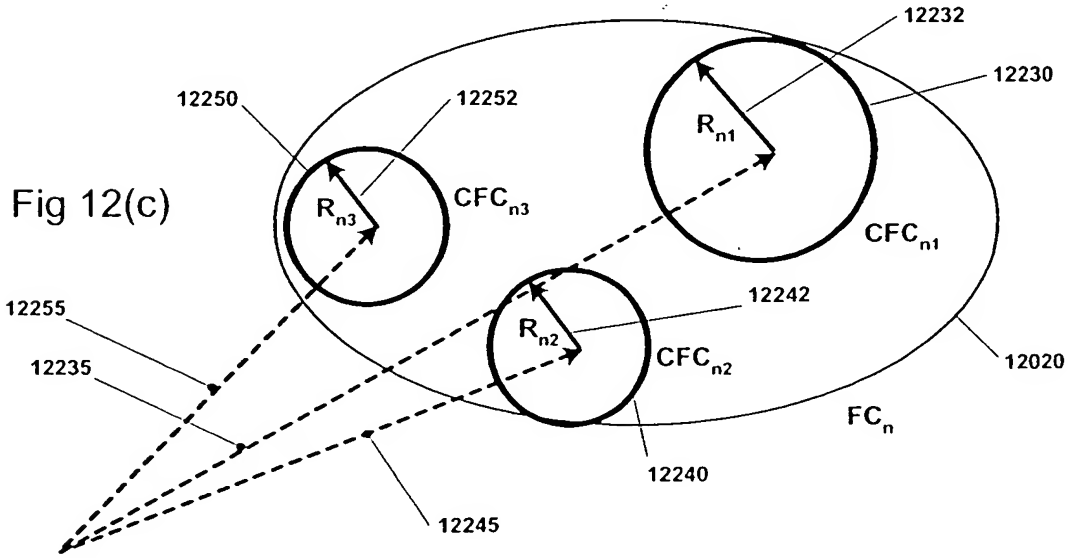


Fig 13(a)

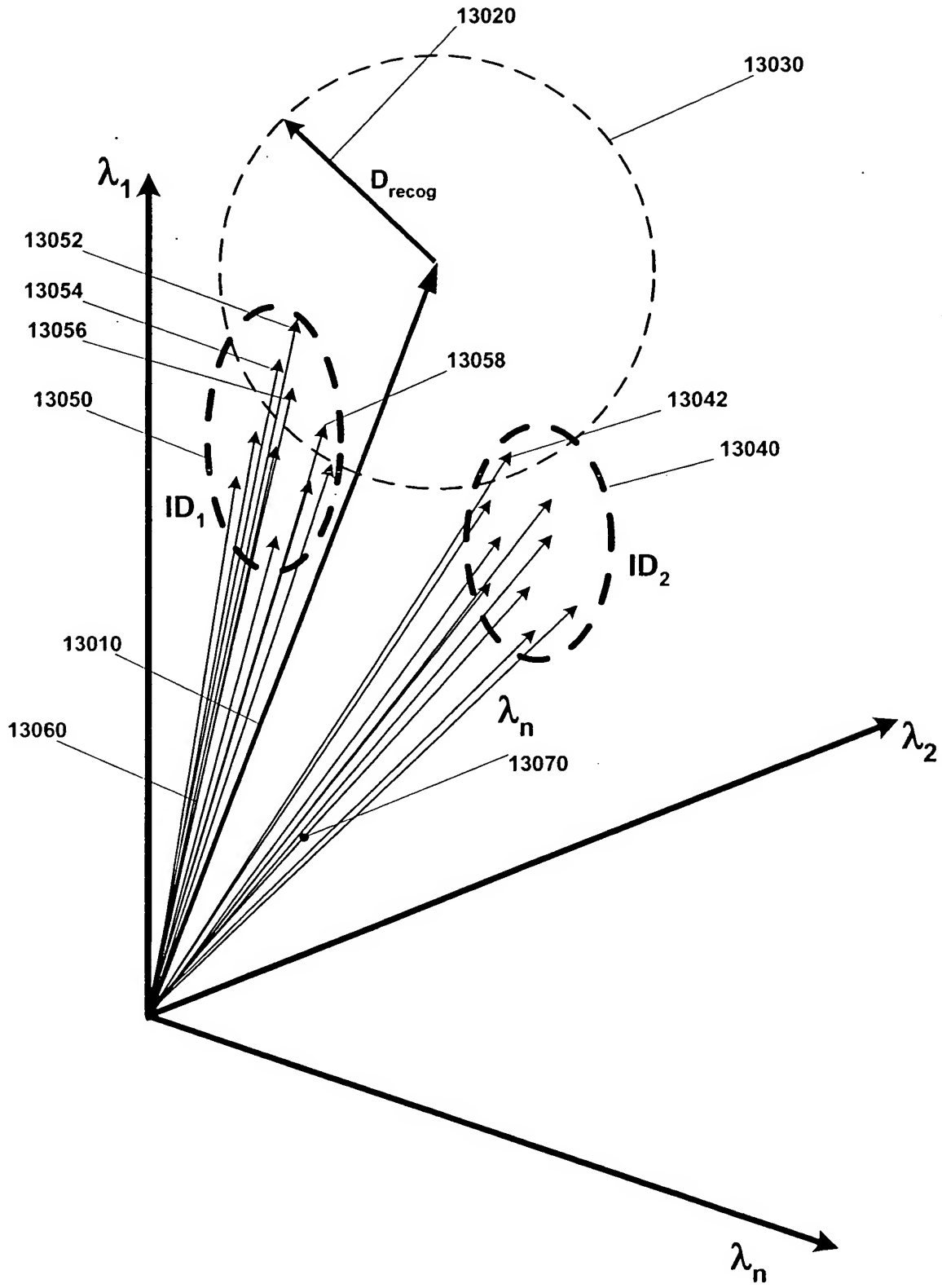

13020
13030
λ_1
D_{recog}
13052
13054
13056
13058
13050
13042
13040
ID_1
ID_2
13010
13060
λ_n
λ_2
13070
λ_n

Fig 13(b)

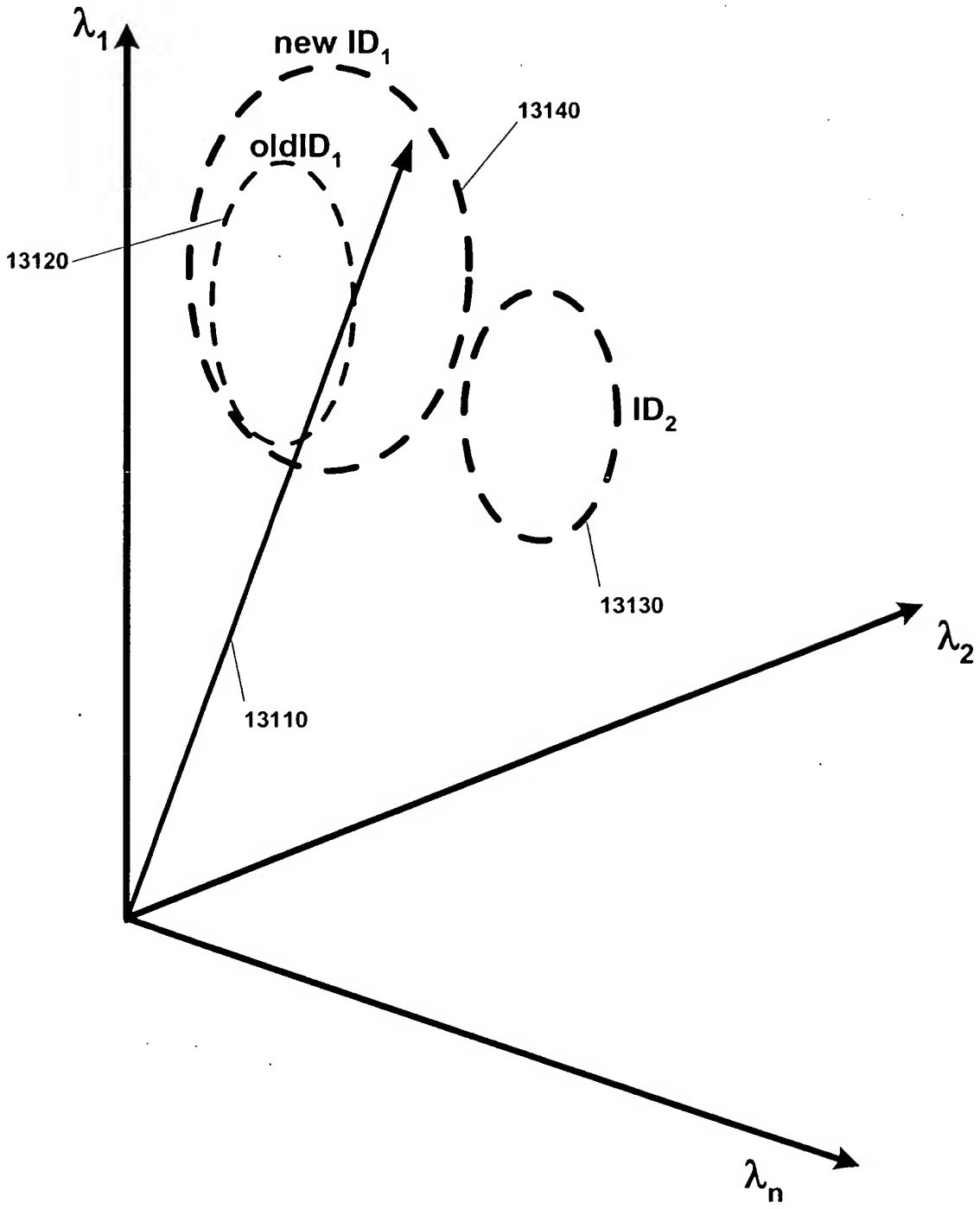
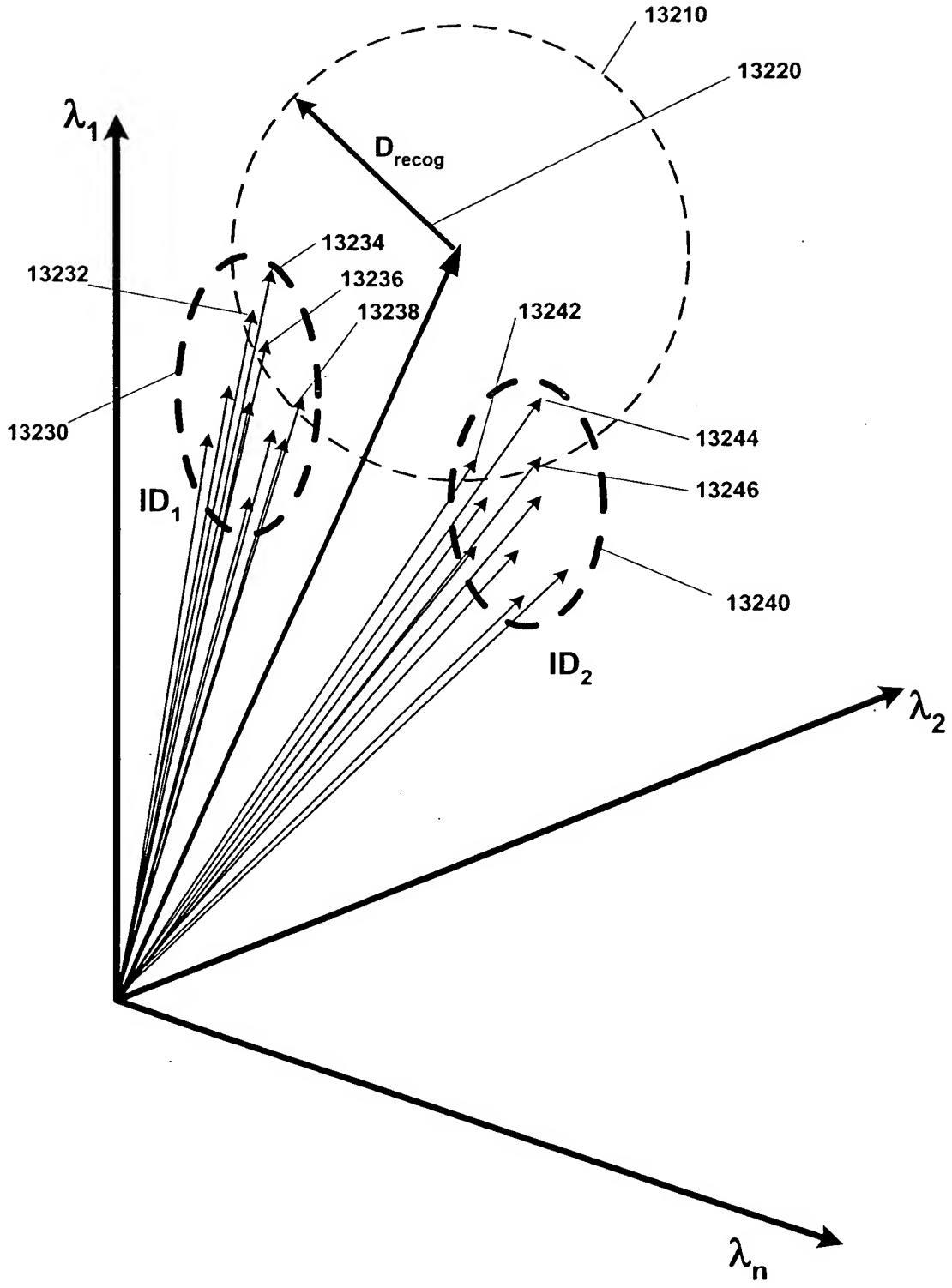

λ_1
new ID_1
13140
oldID_1
13120
ID_2
13130
λ_2
13110
λ_n

Fig 13(c)


13210
13220
λ_1
D_{recog}
13234
13232
13236
13238
13242
13230
13244
13246
ID_1
13240
ID_2
λ_2
λ_n

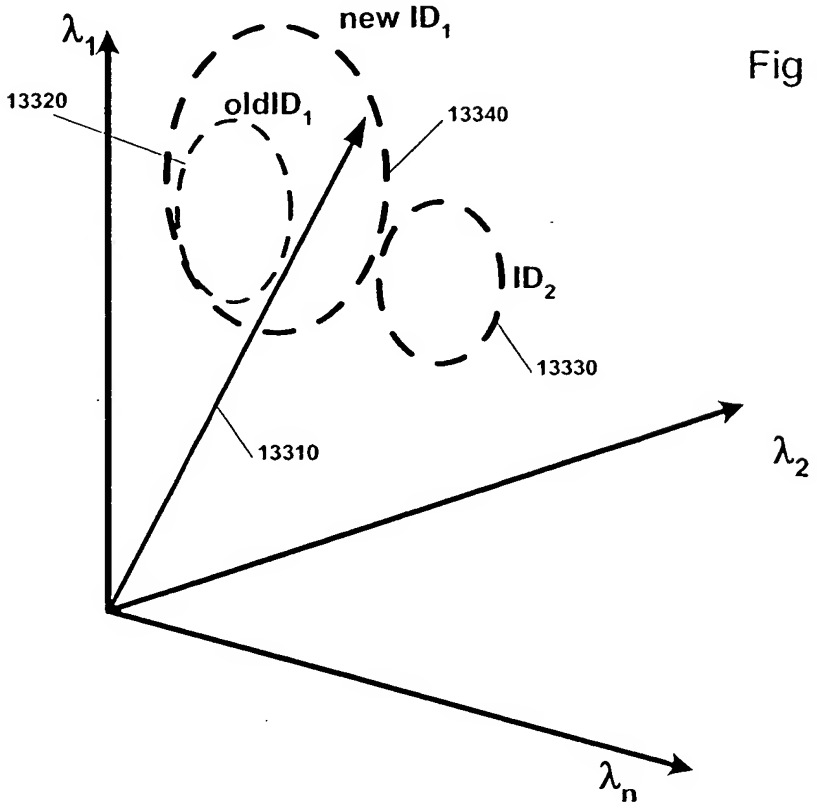


Fig 13(d)

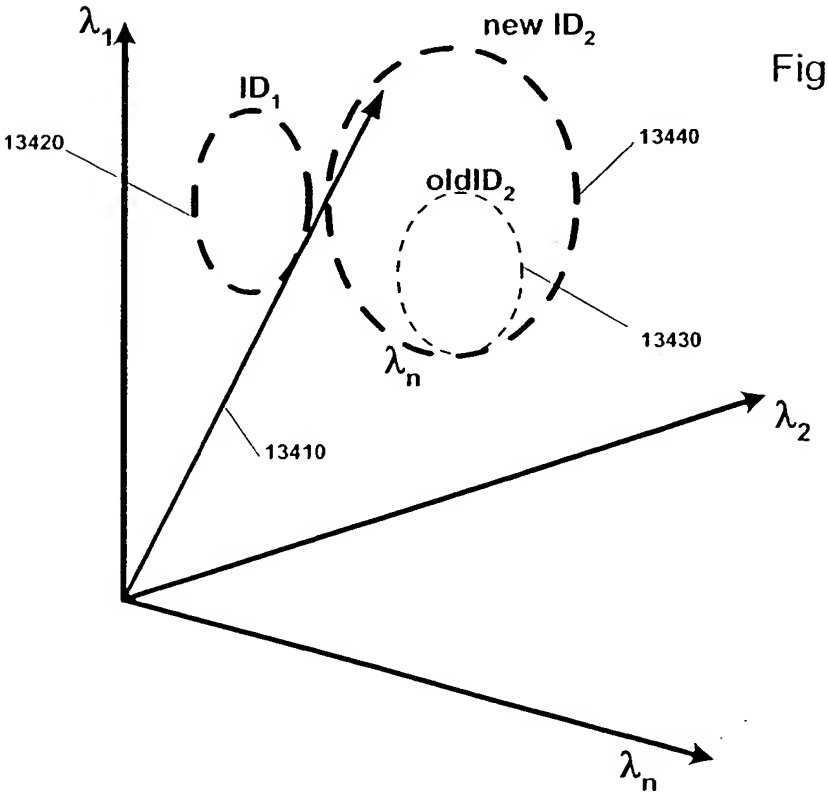


Fig 13(e)

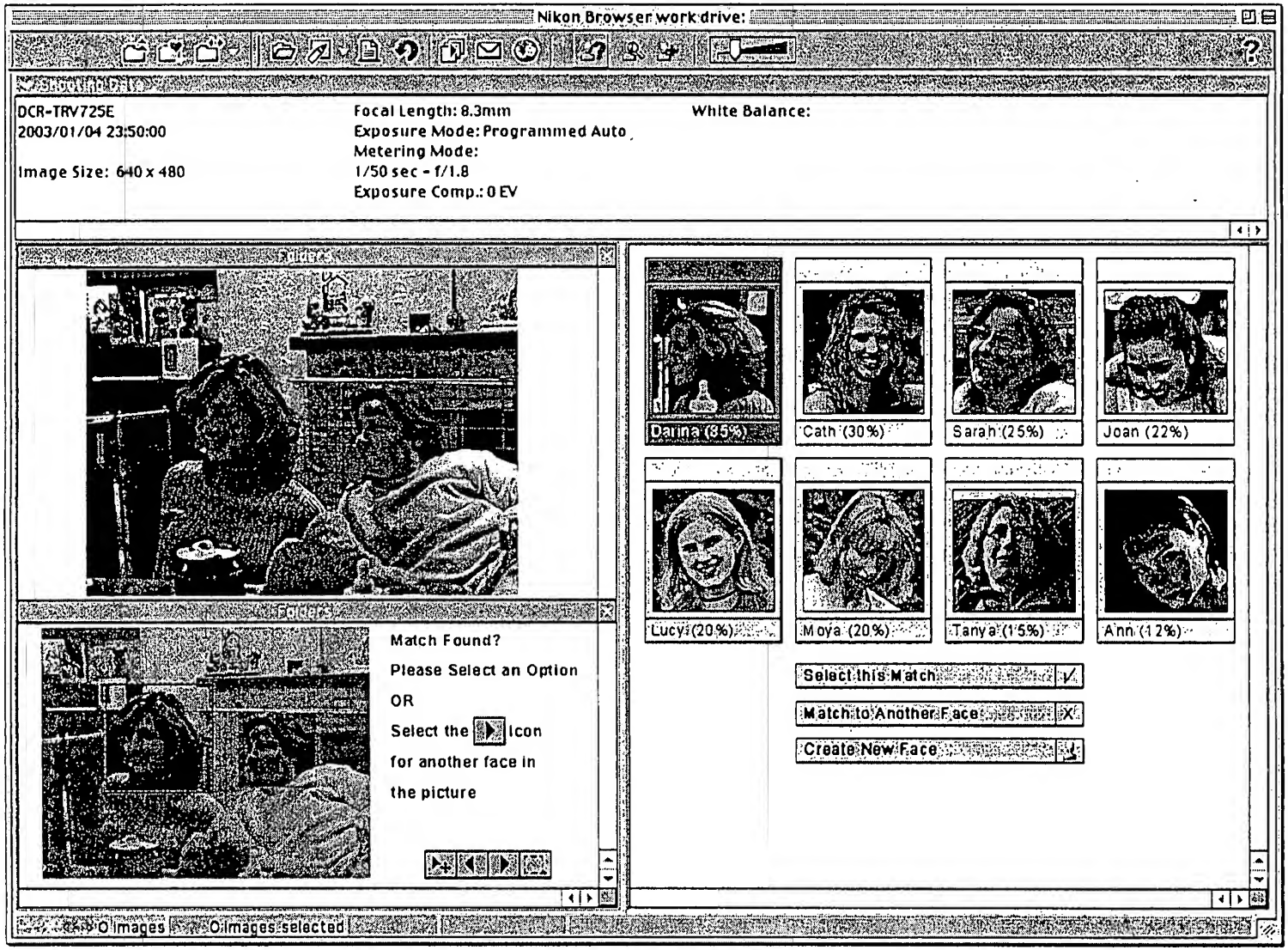

Nikon Browser work drive:
DCR-TRV725E
2003/01/04 23:50:00
Image Size: 640 x 480
Focal Length: 8.3mm
Exposure Mode: Programmed Auto
Metering Mode:
1/50 sec - f/1.8
Exposure Comp.: 0 EV
White Balance:
Folders
Match Found?
Please Select an Option
OR
Select the Icon
for another face in
the picture
Darina (85%)
Cath (30%)
Sarah (25%)
Joan (22%)
Lucy (20%)
Moya (20%)
Tanya (15%)
Ann (12%)
Select this Match
Match to Another Face
Create New Face
0 images
0 images selected

Fig 14(a)

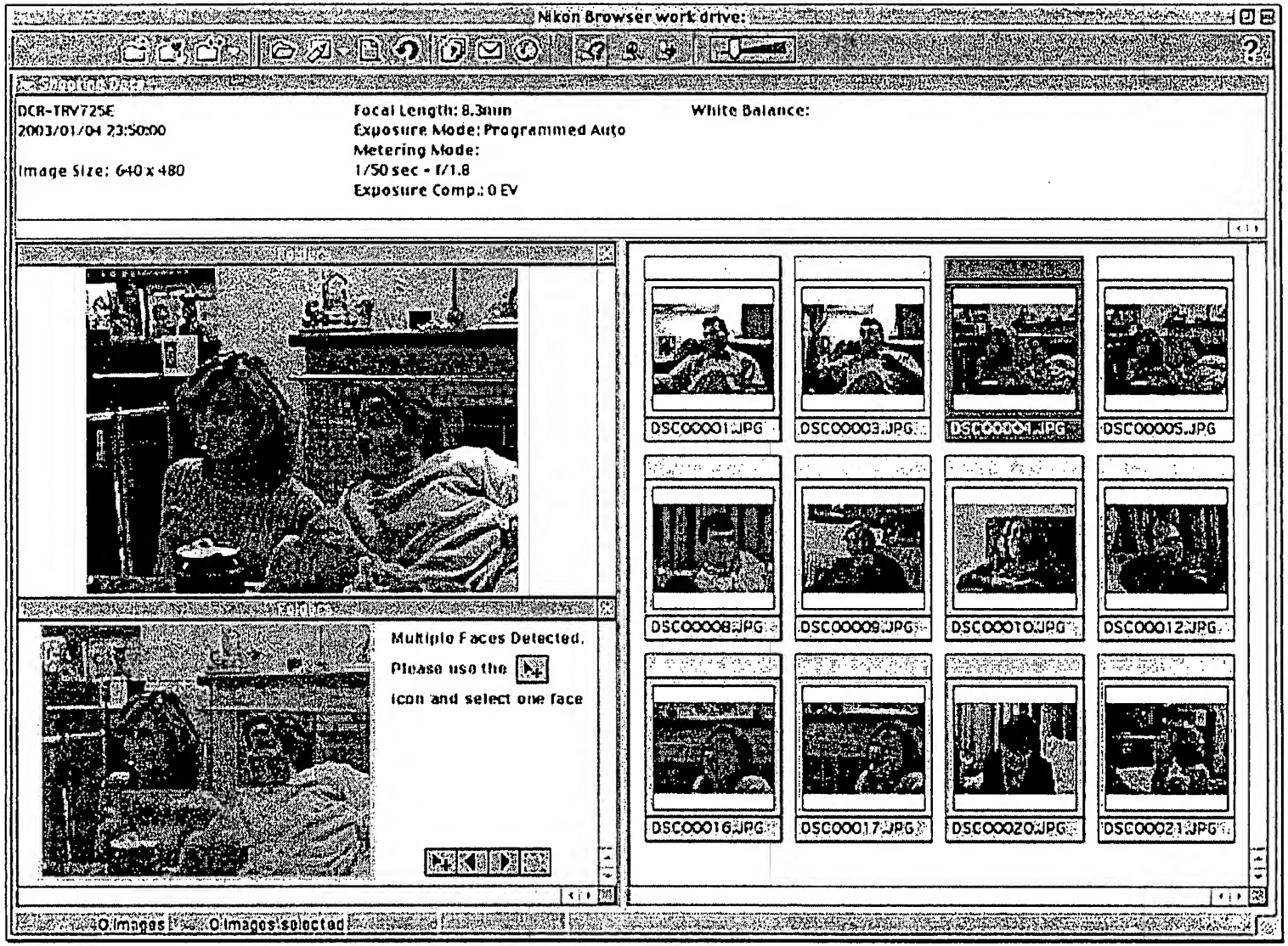

Nikon Browser work drive:
DCR-TRV725E
2003/01/04 23:50:00
Image Size: 640 x 480
Focal Length: 8.3mm
Exposure Mode: Programmed Auto
Metering Mode:
1/50 sec - f/1.8
Exposure Comp.: 0 EV
White Balance:
Multiple Faces Detected.
Please use the
icon and select one face
DSC00001.JPG
DSC00003.JPG
DSC00004.JPG
DSC00005.JPG
DSC00008.JPG
DSC00009.JPG
DSC00010.JPG
DSC00012.JPG
DSC00016.JPG
DSC00017.JPG
DSC00020.JPG
DSC00021.JPG
0 images
0 images selected

Fig 14(b)

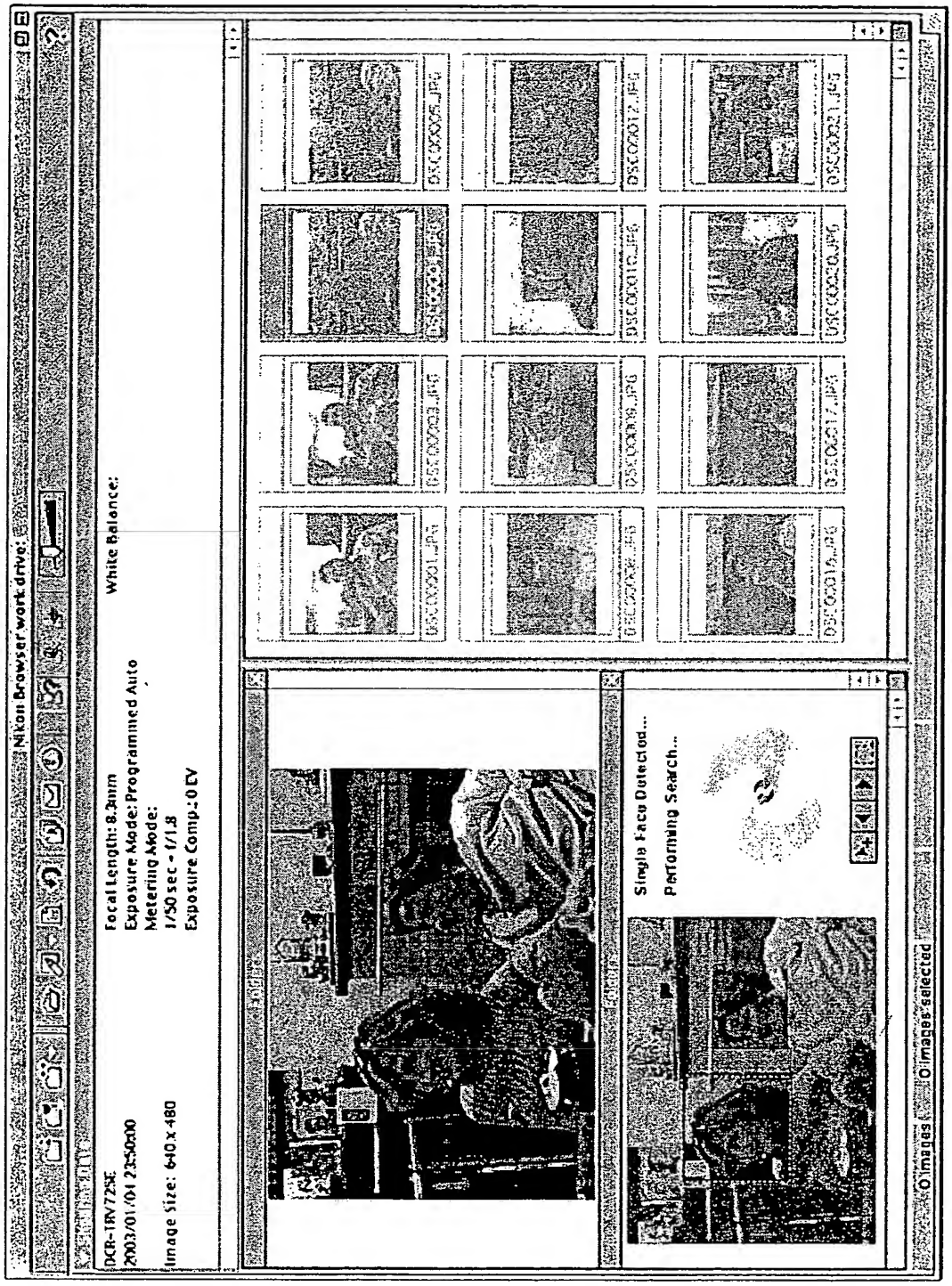

Nikon Browser work drive:
Focal Length: 8.2mm
Exposure Mode: Programmed Auto
Metering Mode:
1/50 sec - f/1.8
Exposure Comp.: 0 EV
White Balance:
Image Size: 640 x 480
Single Face Detected...
Performing Search...
0 images
0 images selected

Fig 14(c)

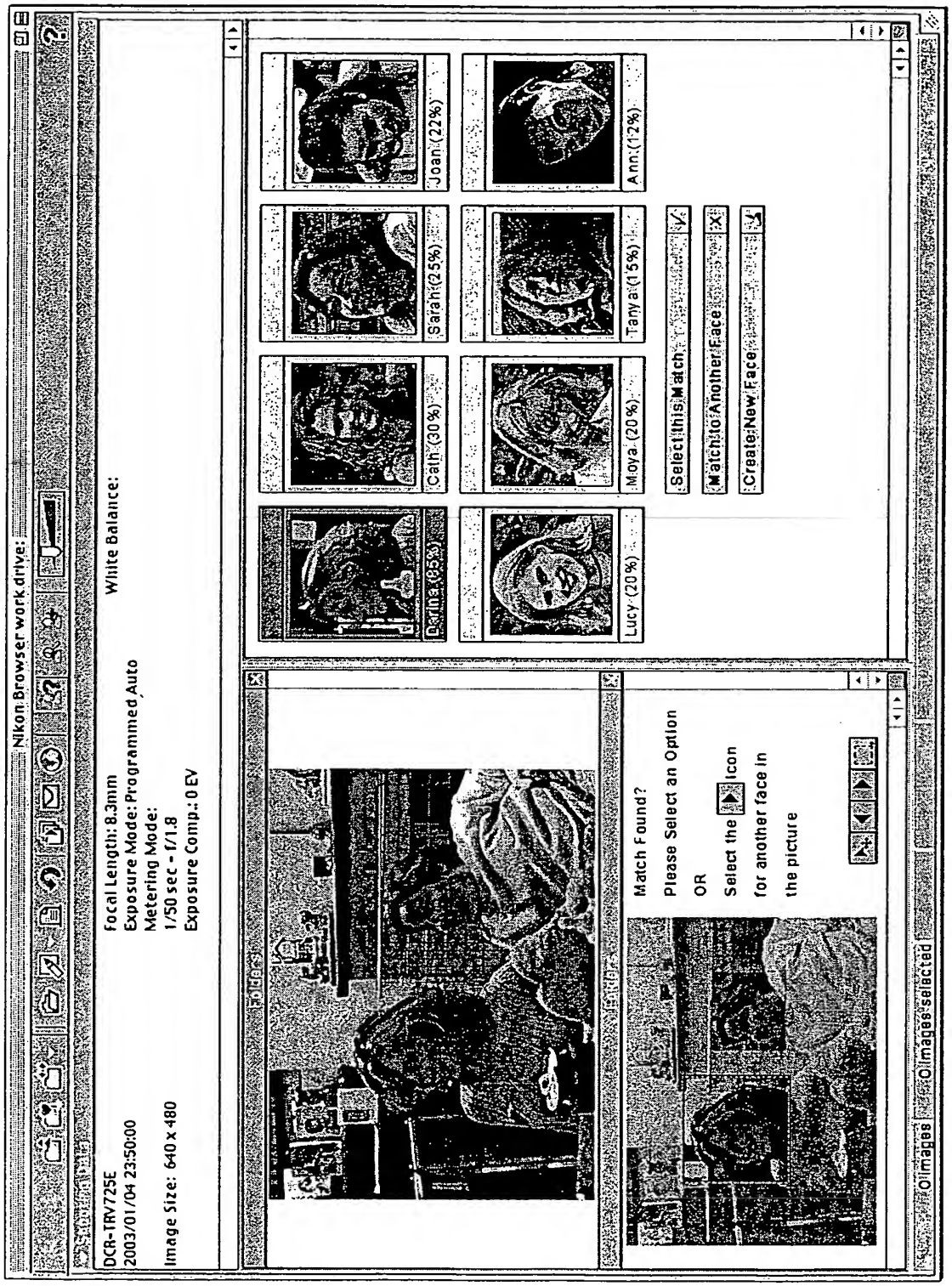

Nikon Browser work drive:
DCR-TRV725E
2003/01/04 23:50:00
Image Size: 640 x 480
Focal Length: 8.3mm
Exposure Mode: Programmed Auto
Metering Mode:
1/50 sec - f/1.8
Exposure Comp.: 0 EV
White Balance:
Folders
Match Found?
Please Select an Option
OR
Select the icon
for another face in
the picture
Darina (85%)
Cath (30%)
Sarah (25%)
Joan (22%)
Lucy (20%)
Moya (20%)
Tanya (15%)
Ann (12%)
Select this Match
Match to Another Face
Create New Face
0 Images selected

Fig 14(d)